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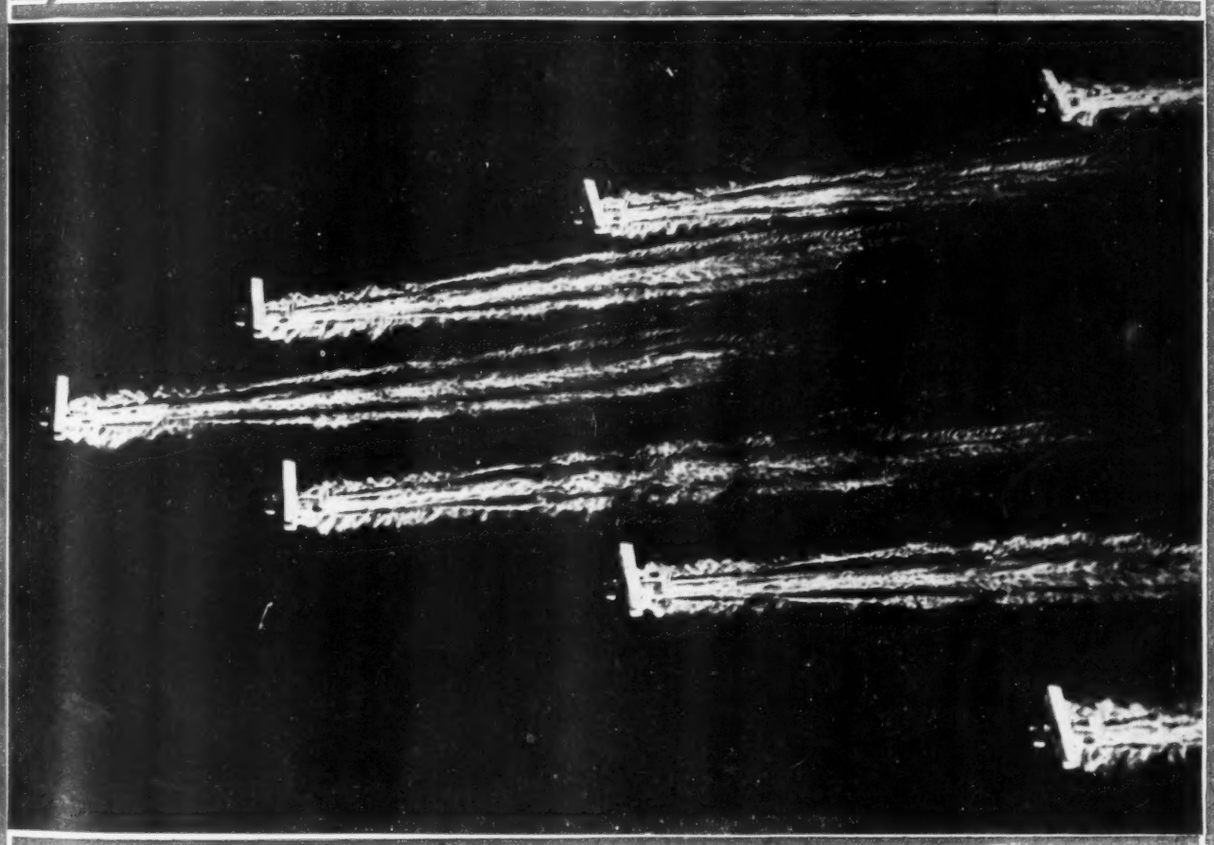

A flight of Navy seaplanes taking off in formation from the waters of San Diego Bay
U. & U.

VOLUME XXIII

NUMBER 7

SPECIAL FEATURES

GERMAN AIR TRANSPORT
THE NEW PACKARD "X" ENGINE
THE FAIRCHILD CABIN MONOPLANE

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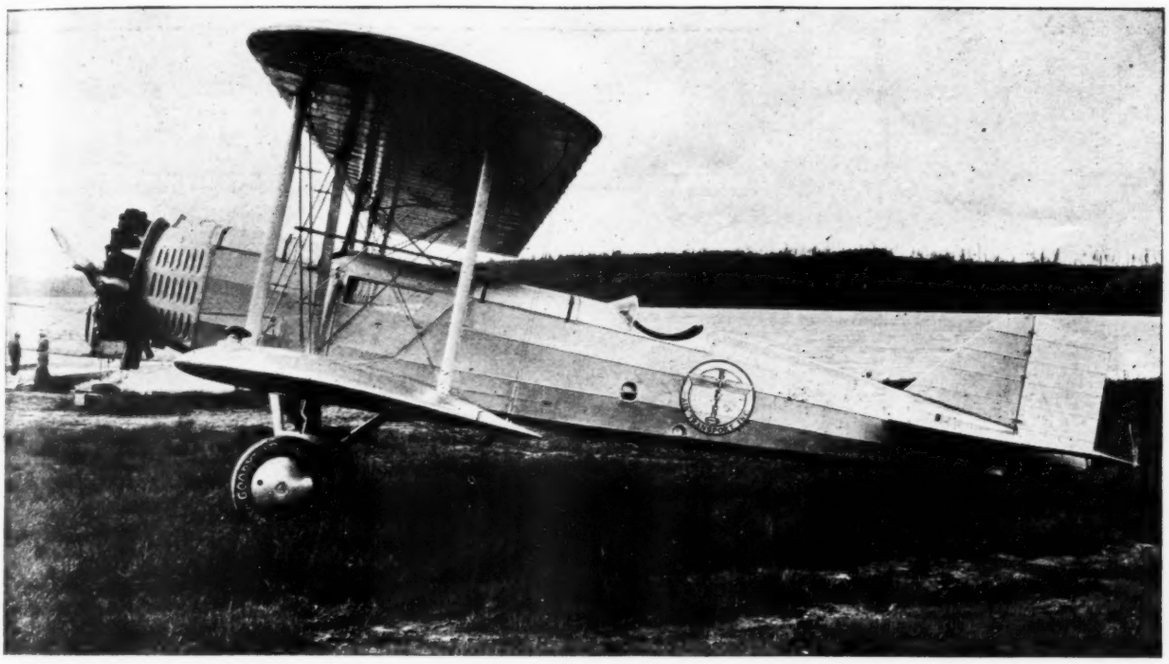

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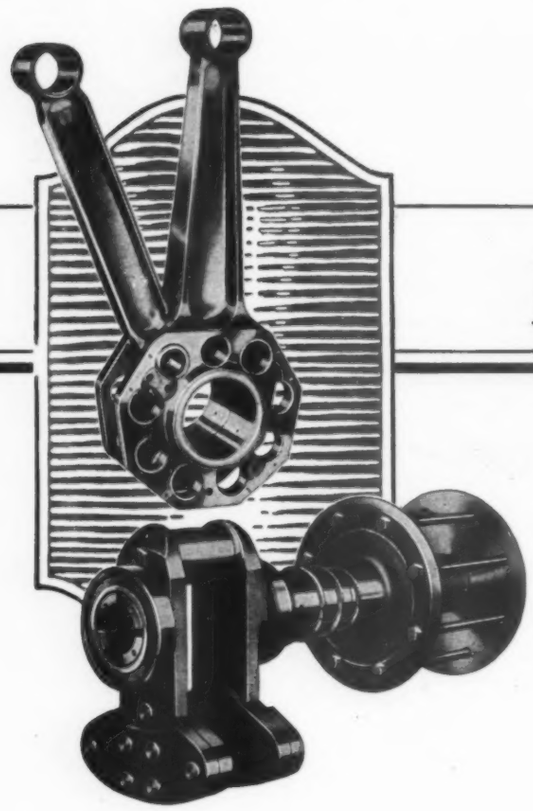

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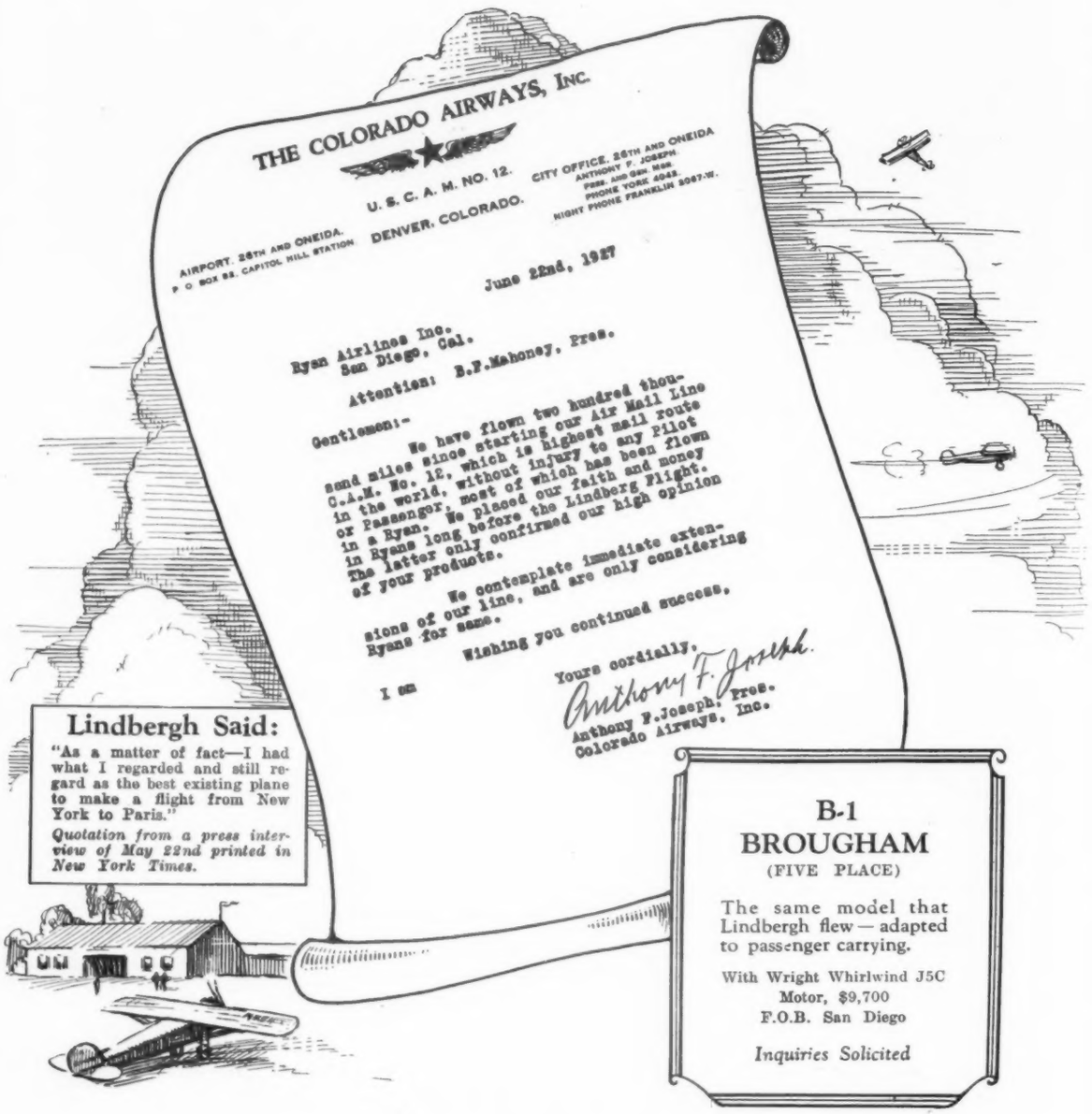
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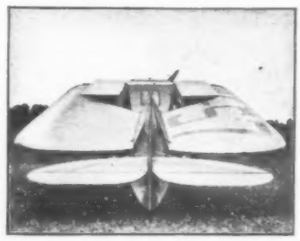

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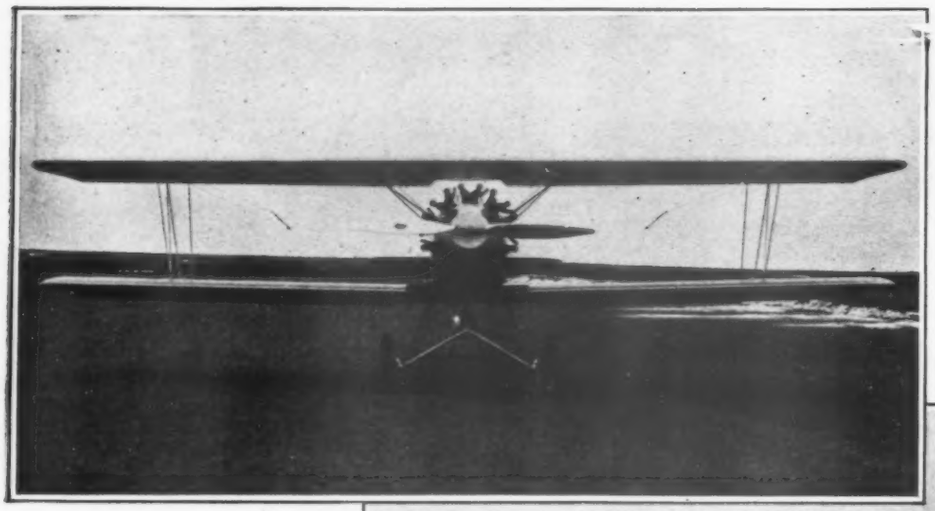
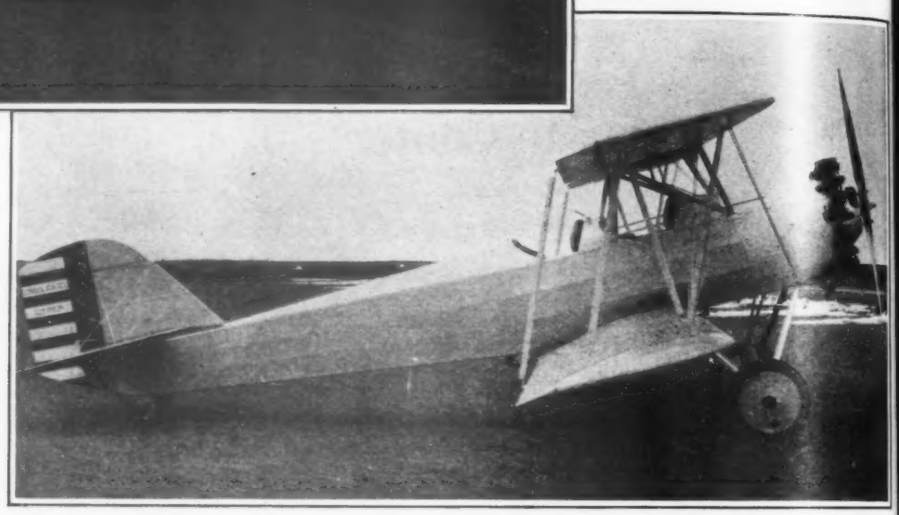
With the Editor

Among the principal aeronautical events scheduled to take place in this country before the snow flies is the proposed attempt by Lieut. Alford J. Williams, U.S.N., to establish new land plane and seaplane speed records with a specially constructed racer now awaiting test flights at Port Washington, L. I.

On page 358 of this issue of AVIATION is a technical description of the power plant installed in Lieutenant Williams' plane. It is a Packard 24 cylinder engine of the X type, and the basis of design is two 12 cylinder water cooled Packard 1500 engines on one crankshaft; one inverted and one upright, developing 1250 hp. at 2700 r.p.m.

The land plane record that Lieutenant Williams will try to better is 278.48 m.p.h. made by the French airman Bonnet in Dec. 1924, and the seaplane mark is 258.873 m.p.h. made by Maj. Mario de Bernardi at Hampton Roads, Va., following the Schneider Cup races last fall.





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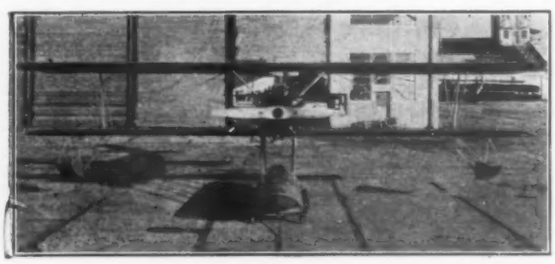

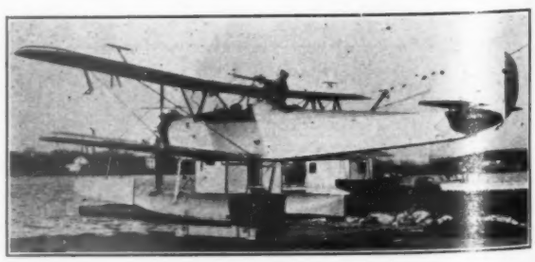

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AVIATION

The Oldest American Aeronautical Magazine

Vol. XXIII AUGUST 15, 1927 No. 7

The Barometer of the Trade

TO THE GENERAL public the spectacular flights of this year have come with such dramatic suddenness that it has led many to believe that they were the results of a sudden spurt in the science of aeronautics. Those who have followed the airplane business more closely realize that the great flights of 1927 have been the result of years of steady progress and growth.

As there is no accurate data on the growth of aeronautics perhaps the best index of the steady advancement of the industry during the past four years is shown by the progress of the aeronautical magazines which after all reflect very accurately the prosperity of the industry. Immediately following the War matters aeronautical were going well and the aeronautical press was prospering. This was the barnstormer's heydey and manufacturers also continued for a while on the tide of the war interest but this impetus did not continue long, for new equipment could not be sold in competition against war surplus material. The barnstormers also began to have hard times for people seemed tired of riding in airplanes. Military manufacturers were suffering from the government retrenchment and from excessive competition in bidding for contracts. By 1923 the airplane industry had reached its low ebb and so had the aeronautical papers. After the Around the World Flight a gradual change came about. Certain barnstormers leased or bought flying fields and settled down and made money. Planes began to be built for commercial purposes and manufacturing for the government was being more reasonably handled.

This growth and the reestablishment of the aeronautical business was so gradual as not to be noticed by the general public but as reflected by the aeronautic papers it was steady and very real. During the period from 1923 until the epic flights of this spring the circulation of air publications was in some cases trebled and the quantity of advertising run in each issue was increased accordingly. This is a proof not of the technical advance of aviation but of actual money making in aeronautics. With stimulated public interest and the investment of new capital there has been a great acceleration in the progress of the industry since the big flights but it should never be forgotten that the three preceding years have each shown a real increase in the amount of business done. This growth is really our best indication of what will take place during the next few years. It is hardly possible to imagine the future growth will be less rapid than in the past and this leads us to believe that by 1930 the amount of flying and the number of planes will have been trebled.

The Minor Details

IN THE glow of romantic and heroic accomplishment that surrounds the successful non-stop trans-oceanic flights of America's airmen one is apt to lose sight of the minor details in sincere and complete admiration of the big ones. On each occasion when those waiting on these shores received news of the flier's, or fliers', safe arrival, tributes were immediately bestowed upon the three main factors of each success; namely, the pilot, the plane and the engine.

In the case of the plane and the engine, their individual successses were made possible by the combined successes of countless minor, yet acutely important, details, all of which were brought to present day perfection through years of intensive study, painstaking preparation, satisfactory and unsatisfactory experimentation, and constant improvement. Each and every part of both plane and engine first had to be thoroughly tried and tested before it could be counted on to play its small part in the success of the whole.

If the facts and figures relative to ideas that were originated and found to be impractical when tested were available; if the amount of time and money expended on first failures were known; if the actual number of fruitless working hours were to be calculated, and if the truth of the sacrifices made in vain were to be told, the world would not even then get a complete conception of what the success of Lindbergh, Chamberlin, Byrd, Maitland and Smith really means to American aeronautics.

Therefore, highest praise is due every engineer, draftsman, mechanic, tester and common workman connected with the development of the planes and engines that transported these heroic airmen to their individual goals. In the estimation of the laymen and airmen they represent the acme of flying ability, but regardless of their prowess they could not have done what they did, had not the minor details of their planes and engines given a combined performance of aeronautically scientific, mechanical and electrical perfection thus far.

But although the great flights proved the merits of the minor details the manufacturers will continue to improve. To originate, test and re-test until something better is obtained; be it only a bolt or a complete engine. By such a process did they obtain their present successes and so will they continue on. Pleased, but not completely satisfied, with what they have, and ever working towards a better performance of the minor details so as to obtain a better performance of the whole.

The New Packard "X" Engine

Basis of Design is Two 12 Cylinder Water Cooled Packard V-1500 Engines on One Crankshaft; One Inverted and One Upright, Developing 1250 Hp. at 2700 R.P.M.

THE PACKARD MOTOR CAR CO., of Detroit, Mich., recently completed what is claimed to be the largest airplane engine in the world. This engine, developing 1250 hp. at 2700 r.p.m. has many possibilities, of which the most imminent is to bring back to the United States the world high speed records for land and sea planes. It is to be flown by Lieut. Alford J. Williams, U.S.N. in a plane built by the Kirkham Products Co., of Garden City, L. I., N. Y. Capt. L. M. Woolson of the Packard Motor Car Company is the designer of the engine.

Actually the new engine is two 12 cylinder, water cooled Packard V-1500 engines on one crankshaft, one inverted and one upright, giving a 24 cylinder engine of the X type. The engine has a displacement of 2775 cu. in., and a bore and stroke of 5⅜ in. by 5 in. The weight dry is 1,402 lb. or 1.122 lb. per hp.

To Try for Land and Seaplane Records

The idea of building an American plane to break the high speed record was first conceived about a year ago. At that time the necessary government funds were lacking, but the project was made possible through the generosity of about 20 New York business men and the Packard Motor Car Co. It was at first decided to use a high horsepower V type engine. Later this X type engine was decided upon and two models were ordered by the Navy, one of which is now complete and installed in the Kirkham racer. The other engine is still under construction.

A speed course has been accurately laid out in Hempstead Harbor, L. I., through the cooperation of civil engineers of Nassau County, L. I. After the water tests are completed the pontoons, with which the plane is now equipped, will be removed and an effort made to break the present land record of 278.48 m.p.h. made by Bonnet of France in Dec., 1924. The present speed record for seaplanes is 258.873 m.p.h. made by Maj. Mario de Bernardi at Hampton Roads, Va., following the Schneider Cup races last fall. It has been hinted that this plane might be entered in the Schneider Cup races at Venice, Italy in the fall.

Aside from the complications in crankcase and crankshaft design, the engine is essentially the same as the standard Packard V-1500 engine. The crankcase of the X type engine is a solid unbroken barrel, giving a rigid foundation to the engine bearings. A great deal of ingenuity was exercised in assembling the engine with this solid crankcase. A crankshaft seven inches in diameter, and said to be as large as that on any aircraft engine in existence, is used.

In respect to the engine mount it might almost be said that an engine was built and the plane fastened to it. Each side of the crankcase is a plane surface with slight bosses at the mounting points. There are three bosses on each side fitted with eight studs each. A Y mounting, machined out of solid duralumin is used. The total weight of the engine mount is 40 lb.

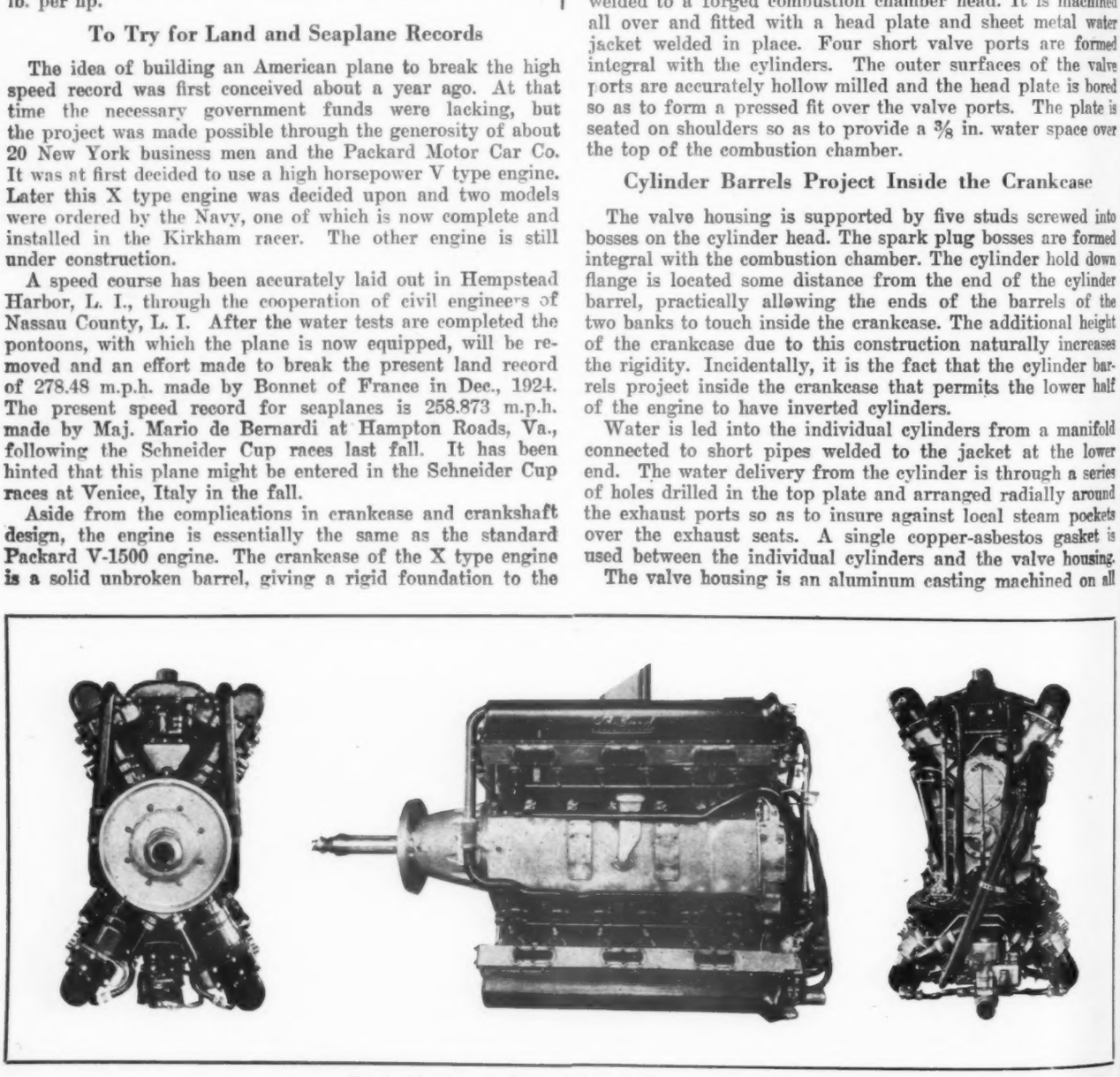
Individual steel cylinders are arranged in banks of six each. They are formed into a block by means of an aluminum casting, termed the valve housing, to which the cylinders are bolted. The cylinder is composed of a drawn steel sleeve welded to a forged combustion chamber head. It is machined all over and fitted with a head plate and sheet metal water jacket welded in place. Four short valve ports are formed integral with the cylinders. The outer surfaces of the valve ports are accurately hollow milled and the head plate is bored so as to form a pressed fit over the valve ports. The plate is seated on shoulders so as to provide a ⅜ in. water space over the top of the combustion chamber.

Cylinder Barrels Project Inside the Crankcase

The valve housing is supported by five studs screwed into bosses on the cylinder head. The spark plug bosses are formed integral with the combustion chamber. The cylinder hold down flange is located some distance from the end of the cylinder barrel, practically allowing the ends of the barrels of the two banks to touch inside the crankcase. The additional height of the crankcase due to this construction naturally increases the rigidity. Incidentally, it is the fact that the cylinder barrels project inside the crankcase that permits the lower half of the engine to have inverted cylinders.

Water is led into the individual cylinders from a manifold connected to short pipes welded to the jacket at the lower end. The water delivery from the cylinder is through a series of holes drilled in the top plate and arranged radially around the exhaust ports so as to insure against local steam pockets over the exhaust seats. A single copper-asbestos gasket is used between the individual cylinders and the valve housing.

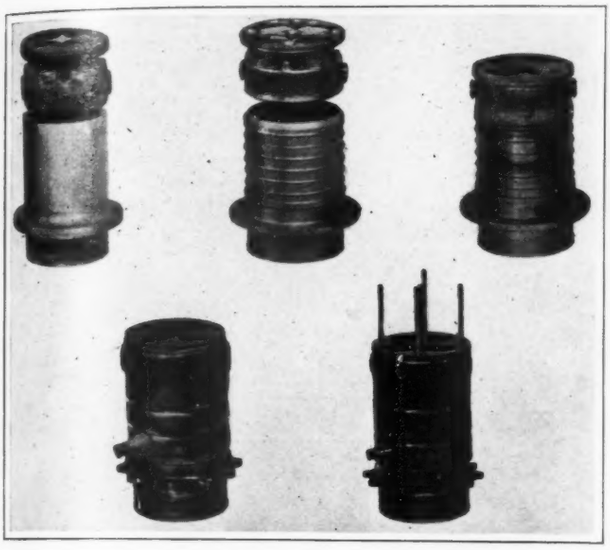
The valve housing is an aluminum casting machined on all



Front, side and rear views of the new Packard "X" engine

PRACTICE WHAT YOU PREACH — USE THE AIR MAIL

surfaces and used interchangeably on right, left, upper, or lower banks. This housing performs four functions. It distributes the mixture to the six cylinders from the carburetor cross header manifold connections. It forms the exhaust passages, each two adjacent cylinders having their two pairs of exhaust ports siamesed into a single exhaust outlet. The water circulated through each cylinder jacket is collected in this

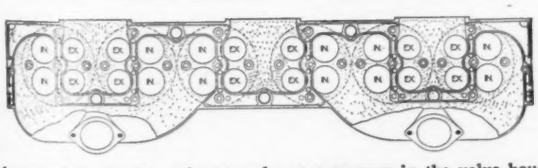


Showing five stages of the construction of a cylinder in the Packard X engine.

housing and delivered through a single outlet at the front of the engine. This casting also supports the camshaft bearing pedestals and valve stem guides.

In the valve gear layout, a single camshaft is used interchangeably for each block of cylinders. Each camshaft has 12 cams for operating the six pairs of inlet and six pairs of exhaust valves in each block. This camshaft is supported by seven heat treated cast aluminum split bearings held down to the valve housing by long studs. The cam followers are prevented from turning by means of a flat milled surface on the side of the camshaft housing. The cam followers are positively lubricated from the adjacent camshaft bearing. The exhaust cam followers are also utilized as pumps to force oil through the exhaust valves for cooling purposes.

The camshaft is hollow and supplied with oil through a continuous metering grove in the rear bearing. In the camshaft journal next to each exhaust cam a hole is drilled opposite to the nose of the exhaust cam. This hole registers with a vertical passage in the camshaft bearing pedestal when the cam is at its highest point and the exhaust valves consequently closed. The oil flows through this passage to the

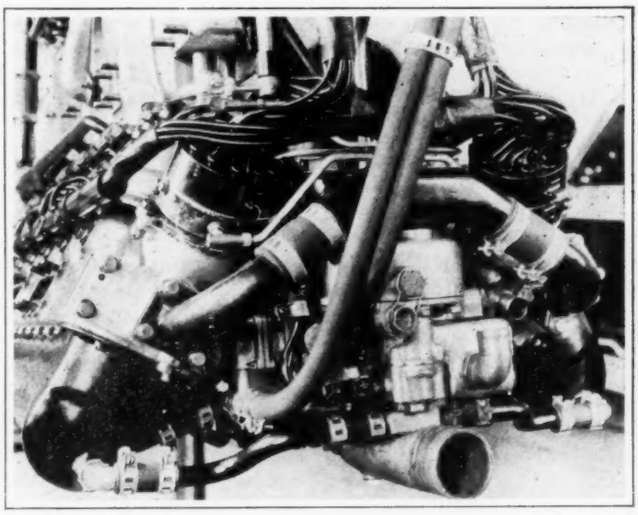


The layout of the intake, exhaust and water passage in the valve housing, siamesing each set of four valves into a common port.

bottom of the cam follower guide which forms a closed cylinder, and the space underneath the cam follower is thus filled with oil. The camshaft revolving cuts communication with this passage and when the cam follower is depressed by the cam the oil can only escape by being forced through the hollow cam follower stem and the horizontal drilled passages leading out through the drilled tappets into the exhaust stems. The latter are drilled out their entire length, the lower end of the hole in the valve being closed by a screwed-in plug. A small steel tube is welded to this plug and is centered in the counterbore at the upper end of the valve stem. The oil is forced down through the tube and out at the bottom through horizontal holes, thus cooling the head of the valve. The oil is then discharged through the annual space between the tube and the inner wall of the valve and out into the valve housing through horizontal holes drilled in the upper end of the valve stem just below the counterbore. With this system a positive means of cooling is provided by which a fixed quantity of oil is pumped through the exhaust valve each time that it is opened. In this way the exhaust valves operate at a very low temperature and the valve seat is preserved.

The valve springs are of the multiple cluster type and consist of a group of thin piano wire springs arranged in planetary fashion around the valve stem. Seven of these springs are used with each valve. The individual springs are located over tubular guides welded to a lower fixed washer; the upper ends of the springs engage in an annular groove formed in the movable spring washer. These tubular guides are off-set from the perpendicular, causing the valve to rotate, thus insuring a good seating for the valve.

A very light sheet aluminum cover is fastened to the valve housing and prevents external leakage of oil. This cover makes a taper fit over the ignition distributor drive housing. Oil from the valve housing is returned to the crankcase



Lower rear view of the Packard X engine showing two distributor units and the fuel, oil and water pump unit.

through drains placed at both ends of the engine and provided with oil traps to prevent crankcase vapors from accumulating in the valve gear compartment.

The pistons are aluminum castings of the slipper type. They are very short and comparatively light, though of rigid construction. They are 5⅜ in. in diameter, 3 11/32 in. long and weigh 2.94 lb. for the piston bare. The length of the piston was established after a series of tests in which the length of the skirt was gradually diminished. The connecting rods are of the forked type fitted with Sumet bronze bearings. The piston pins in the connecting rods are of phosphor bronze.

The timing gear and accessor layout is similar to that on the Packard 1500 engine. All fuel, oil and water pumps are combined into a single unit, driven from a bevel gear mounted on an extension on the crankshaft.

The engine is to be tested with battery ignition though provision has been made for the installation of magnetos. It is expected that in the flight tests both systems will be tried.

A starting dog, engaging the end of the crankshaft at the propeller end, is connected to the starter by a universal joint. The starter consists of a tripod of steel tubes mounting three automobile starters connected to one flywheel. This starter is now mounted on a fast motor boat for use during the water trials.

At the time of writing the engine has seen a total of 16 hr.

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on the torque stand, dynomometer and in the plane. The method used to absorb the power in testing this engine is very ingenious. It consists of an electrical dynomometer coupled with a water brake. It was developed by Capt. Woolson and built by the General Electric Co.

In the design of this engine, with which it is hoped to break the existing world records by at least five miles per hour, more attention was given to the reduction of frontal area than to low weight. The engine has 161 hp. per sq. ft. of frontal area which is less than most air cooled engines. The total weight of the plane, with fuel, oil and water is 2.4 lb. per hp.

The general specifications include:

Bore	5⅜ in.
Stroke	5 in.
Displacement	2,775 cu. in.
No. of cylinders	24
Rated hp.	1,250 hp.
Rated r.p.m.	2,700 r.p.m.
Weight, dry	1,402 lb.
Weight per hp.	1.122 lb. per hp.
Frontal area	7.777 sq. ft.
Frontal area per hp.	161 hp. per. sq. ft.

Form Aviation Development Organization

Some of the most important business men and civic leaders in Southern California and Arizona were recently included in the advisory council and board of governors of an organization devoted to the promotion and development of aviation to be known as "The Falcon Fliers".

The purpose of the organization is "To exist as a non-profit organization where no pecuniary profit is to be the object; to promote the general progress of civil aviation and to provide flying fields and equipment for operation and instruction in the use of aircraft; to secure and disseminate technical information relative to construction and operation of aircraft; to create and maintain public interest in aviation; to bring together persons who are interested in the progress of aviation; to provide social, scientific and other benefits from the use of such equipment, facilities and advantages by closer association and to cooperate with city, county, state and federal governments in creating a civilian reserve of pilots and technically trained personnel for the common defense in time of need."

The officers of the Falcon Fliers are: Edward H. Sharp, an official of the Southern Pacific Railroad, president; R. E. Fisher, vice president; L. G. Peterson, secretary, and an executive committee consisting of H. Allen Sullivan of The Douglas Co., William Henry, Fred T. Beaty, and H. B. Klingensmith.

Research Data Destroyed by Fire

Valuable data from researches carried on over a period of years was destroyed as well as three small experimental planes when flames partially destroyed the old aeronautical laboratory of the California Institute of Technology at Pasadena, Cal., July 24.

An experimental plane belonging to Prof. A. A. Merrill of the Caltech faculty embodying several new ideas in flight was among the planes lost. Another small ship weighing only 400 lb. built by a student, Fred G. Tearle, was destroyed. This plane was practically ready for tests and it's trial flights were the subject of rather keen anticipation on the part of the designer and faculty members. A third plane burned was being finished by Clark Millikan another faculty member.

A fine new aeronautical laboratory to cost $300,000, a gift from the Guggenheim Fund, is now under construction, although it is considered likely that the old quarters will be rebuilt at once for present needs. The financial loss is estimated at $10,000, however the loss in records and previous research data cannot be estimated.

Fairchild Engine in Waco 10

One of the disappointments of the Ford Tour was the non appearance of the Waco 10 fitted with the Fairchild Caminez aircraft engine. This engine of radically new design had passed a fifty hour test and the Ford Tour was expected to provide a public test under actual flying conditions. Unfortunately delivery was not made on the Waco until just before the race and though the engine was ready there was not sufficient time to make the necessary fitting and to test the plane. As the photograph shows the engine fits in very well to the line of the fuselage and considerably better visibility is obtained from the pilots and passengers seats than with the OX-5 engine. Many hours of flying have now been put in with the Waco Caminez combination and the results, especially the take off and climb are very satisfactory.

Side view of the Waco 10 powered with a Fairchild Caminez engine.

N.A.C.A. Publishes Technical Note No. 258

"A Warning Concerning the Take-Off With Heavy Load" is the title of the N.A.C.A. Technical Note No. 258 by Elliott G. Reid and Thomas Carroll. Two years ago the writers of this note instituted and carried out an investigation of ground effect. The results of this work have been published only very recently in N.A.C.A. Technical Report No. 265, "A Full Scale Investigation of Ground Effect". In this report it was pointed out that the climbing ability of an airplane is favorably affected by proximity to the ground and particularly so in the case of a heavily loaded one. One of the most important conclusions to be drawn from this work is that an airplane can be taken off with a load greater than that which can be successfully carried across country. A successful take-off can be made with a plane so heavily loaded that it cannot climb to a height greater than the span of its wings. The explanation is that the power required to maintain level flight at an altitude of the order of the wing span may be as much as 50 per cent. greater than that necessary when the airplane is just clear of the ground.

Copies of these reports may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

A. S. P. A. Forms Astoria Aero Club

The Astoria Aero Club of Astoria, N. Y., has been formed under the auspices of the American Society for Promotion of Aviation, and has a membership roll of fifty.

The officers are as follows: President, L. Lowy; 1st V. P., L. Leonard; 2nd V. P., M. Canavan; Treasurer, W. Saigman; Financial Secretary, N. Norich; Secretary, P. Kip; Assistant Secretary, M. Keller; and Sergeant at Arms, J. Roth.

Negotiations are under way to purchase a plane. Igor Sikorsky has accepted the honorary presidency.

Navy Pilot Reached Altitude of 38,559 Ft.

The Bureau of Standards announces that the official altitude attained by Lieut. C. C. Champion, U.S.N., in his flight on July 25 in a Navy Apache ("Wasp" equipped) was 38,559 ft.

The barograph used by Lieutenant Champion, although slightly damaged by fire and jars when he was forced to descend after two cylinder heads of the motor were blown, was turned over to the Bureau of Standards for calibration. The Bureau, after tests, announced that the instrument had recorded a height of 38,559 ft., and it could not be ascertained whether it had stopped functioning at that height from vibration of the plane.

The world's altitude record, 40,820 ft., is held by Callizo, a Frenchman. The American record is 38,704 ft. and is held by Lieut. John A. Macready, of the Army, established on January 20, 1926.

Belgium Airmen to Try Distance Flight

A report from Belgium states that plans are now in operation for attempting of a non-stop flight from Brussels to the Belgian Congo, a distance of about 3,973 mi. Lieutenants Medaets and Verheagen of the Belgian Military Aviation Service, are the fliers selected. In the event that the outward trip is successful a return flight will be made in two stages, one of about 2670 mi. and the other about 2050 mi.

Last year, with Lieutenant Medaets as pilot and Lieutenant Verhaegen as navigator, a Breguet biplane was flown from Brussels to Leopoldville in seven stages.

A Breguet biplane will be used again, model XIX, powered with a 12-cylinder V type 600 hp. Hispano-Suiza engine, with directly geared propeller. The two planes will have a total lifting surface of 570 sq. ft., and for the flight will weigh, loaded, in the neighborhood of 11,000 lb., and will have a theoretical range of flight of about 4660 mi.

It is stated that the fuel will consist of about 1083 gal. of gasoline contained in a central tank in the fuselage, and in two auxiliary tanks in the upper wing. The cruising speed will be from 108-112 m.p.h., with a maximum speed of 155 m.p.h.

The general equipment will be very simple, navigation depending upon sight and a compensating compass, and no radio apparatus will be carried, both because of weight and because during that part of the journey on which it might be most needed, that is, beyond the Mediterranean, there will be no ground stations with which it would be possible to keep in touch.

Radio Beacons for Dole Flight Entries

At the request of the chairman of the Dole North American-Honolulu Flight Contest Committee, the experimental radio beacons at Crissy Field, Calif., and on the Island of Maui, Hawaiian Islands, will be maintained until after the Dole Flight, entries for which closed at noon, Aug. 12. It is the intention of the War Department to then transfer the radio beacon now installed on the Island of Maui to Wheeler Field, Oahu, for permanent installation.

The use of the radio beacons will be made available to civilian participants whose planes are so equipped as to justify expectations for effective results.

Though glad to make this service available, the War Department has provided that entrants be informed of the experimental nature of the installations and of the fact that the Department does not guarantee operation or assume any responsibility in connection with the use of the beacons.

Here is the Answer

The above photograph, which was also printed in last week's issue of AVIATION, is of the Loening M-8 monoplane constructed in 1918. It was in this plane that Maj. R. W. Schroeder broke the world's altitude record for both pilot and passenger and pilot and two passengers in November and December 1918. This plane equipped with a 300 hp. Hispano engine carried 1,000 lb. load at a high speed of 146 m.p.h. and a ceiling of 21,000 ft.—a performance that is exceedingly creditable when compared to the high performance of a present day two seater, such as the Curtiss "Falcon". As can be seen from the photograph, the plane has lifting struts which attributed greatly to its efficiency, and were well known to the art some five years before the first Bellanca monoplane was built, and practically ten years before the recent trans-Atlantic flights of the Ryan and Bellanca called attention to the efficiency of this type of wing structure.

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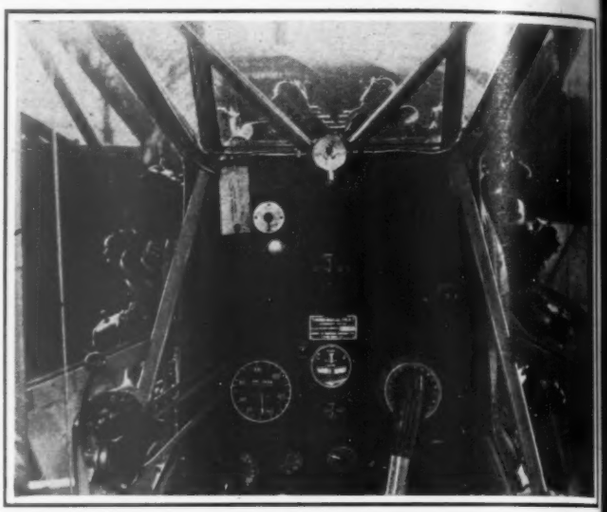
The Fairchild Cabin Monoplane

Designed for Varied Classes of Activity, Has Folding Wings And is Powered by a Wright Whirlwind or Curtiss C-6 Engine

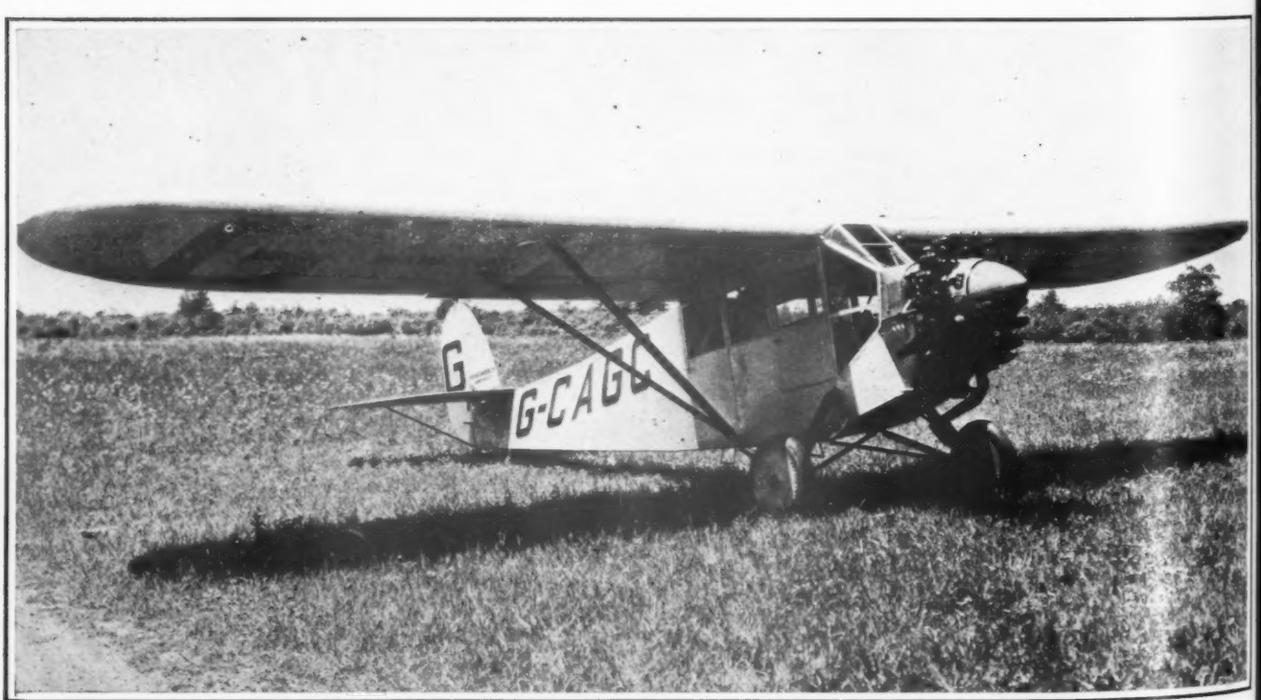
THE FAIRCHILD "All-Purpose" cabin monoplane which has been under development for the past two years has now been put into production by the Fairchild Airplane manufacturing Corp. at its Farmingdale factory. The unusual performance and unique features of this plane have resulted in a sales response which surprised even those connected with its development. The first production lot of six machines was quickly sold out and sufficient additional orders received to warrant the continuance of production which is now going on. R. H. Depew, Jr., who is handling the airplane sales is quite enthusiastic about the reception given to the cabin monoplane and the rate at which orders are coming in.

One of the features of the Fairchild cabin monoplane is the folding wings. While folding wing machines are far from being new, this type of wing has in the past been confined to biplanes and has always involved the use of auxiliary struts and other complications. Instead of the usual complicated strut arrangement as found on folding wing biplanes, the Fairchild monoplane wing is surprisingly simple and a casual glance at the machine in flying order gives no indication of the fact that its wings can be folded. Two struts brace the wings on each side and the lower ends of these struts are carried together to hinge points on each side of the fuselage, thus making it possible for the wings to swing straight back. The locking devices for holding the wings in flight position are the result of extensive study and are so designed that the wings are as rigid as in non-folding types. They are held in position by safety locks located in plain view of the pilot. As an additional precaution, the lever controlling the safety lock is itself secured in position by means of a padlock.

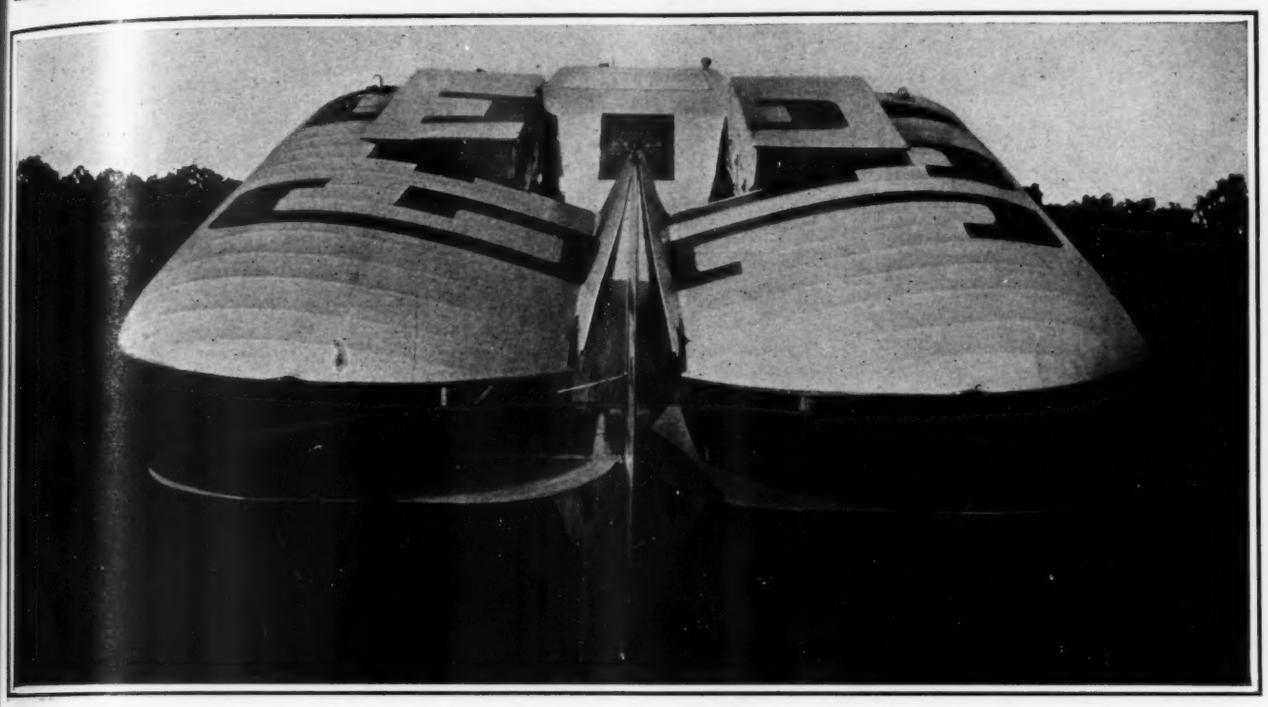
The pilot is seated in the same cabin with the passengers and in front of them. The four passengers are seated in pairs behind the pilot, the two front seats being so arranged as to allow them to be folded to permit the carrying of mail or packages, or to adapt the airplane for aerial photographic work. It is this feature, combined with several others, which inspired the Fairchild organization to call the cabin monoplane the "All-Purpose Airplane". Full justification for this title seems to be given in the varied classes of activity for which the machines already sold are to be used by their purchasers. The passenger cabin has about 90 cu. ft. of space available for cargo when the machine is used in this service. In addition, a 35 cu. ft. compartment is available



Interior view of the pilot's compartment on the Fairchild "All-Purpose" cabin monoplane.



Three quarter front view of the Fairchild "All-Purpose" cabin monoplane equipped for operation as a land plane.



Rear view of the Fairchild cabin monoplane with the wings folded

for passenger baggage or for additional cargo. This space is located behind the cabin and access is obtained through a door in the side of the body. When the machine is used for package or mail transport a payload of 800 lb. with full tank of 1100 lb. with three hours fuel may be carried in the 125 cu. ft. of space available. Three large doors are provided, one on either side for passengers and one on the right hand side for the pilot.

In order to provide the utmost vision for the pilot he is seated in the extreme front of the cabin. Although completely enclosed his vision is comparable to that in any open cockpit type of airplane. Not only is unusual vision provided for the pilot through the liberal windows on each side and bottom, but the "necking-in" of the fuselage and the low position of the engine make it possible for him to look *straight ahead.* It suggests the vision afforded the drive of an automobile in looking over the engine hood. To guard against cutting off a following airplane by turning across its path, a window is also provided in the top of the cabin, giving the pilot good rearward vision.

Conventional Stick Control is Used

Conventional stick control is used and the rudder control is by means of swinging pedals. The wheel brakes are operated by levers attached to the foot pedals and which are so arranged that the pilot can trail his heels on the floor in flight. The stabilizer is adjusted by a hand wheel at the left of the pilot's seat. Access to the pilot's seat is obtained either directly by means of a door on the right side or through the passenger cabin.

The wings are constructed of wood with conventional fabric covering, the spars being of the built-up box type and the ribs of I-section type constructed of ply wood with flanges. The main wing struts are of steel tubing, designed to take both tension and compression. Although the struts are designed to take a full load, as an additional precaution a safety cable is carried from the wing through the strut to the lower wing pin and a second cable is carried under the fuselage connecting the two wing pins. Thus the cables form a complete link from wing to wing, passing under the fuselage. Factors of safety throughout the entire design correspond to the Department of Commerce requirements.

The folding wing construction is so simple that the machine can be completely folded or rearranged in flight order by two men in about two minutes and without the use of any tools. With the wings folded, the machine will easily pass through a doorway 12½ ft. wide and 9½ ft. high, thus making it possible to increase the utility of hangars. The space actually occupied by the machine folded is only 373 sq. ft. With the wings folded, but otherwise completely assembled, the cabin monoplane can be towed behind an automobile over ordinary roads and may be transported very conveniently in this manner. The extremely low time required for folding or assembling the wings is due largely to the fact that no controls have to be disconnected.

The tail surfaces are of welded steel tubing and are fabric covered. The horizontal stabilizer is adjustable in flight by means of a hand wheel placed at the left of the pilot's seat. The longitudinal control afforded by the adjustable stabilizer is sufficient to permit the airplane to be flown "hands off" with either full load or pilot alone. The vertical fin is offset to relieve the pilot of the necessity of holding "right rudder" in flight. Elevator controls are duplicated as an added safety feature.

The landing gear is of the divided-axle type, which is now becoming generally used. Skiis may be interchanged with landing wheels when required. A pontoon type of landing gear is now being constructed and can be furnished where the cabin monoplane is to be used as a seaplane. Wheel brakes are standard equipment. The wheel bearings are lubricated by means of Alemite-Zerk fittings.

Novel Type of Shock Absorber

The customary shock absorbers have been replaced by a novel type of oleo-gear combined with steel ring springs which require practically no maintenance or attention. They are a new development consisting of a series of steel rings arranged so that they are forced inside of each other when subjected to compression. The rings are located inside of the oleo-gear oil chamber and the oil used for dampening the shock also serves to lubricate the steel rings. Fairchild tests show that this type of spring absorbed and converted into heat even more of the work of compression than did the ordinary rubber shock absorbers which were formerly regarded best from this viewpoint. The combined use of the springs and oleo-dampening gear provides a landing gear entirely without rebound.

The regular power plant installation consists of a Wright

Three quarter view of the Fairchild cabin monoplane on floats.

Whirlwind engine. This type of engine was used in most of the flights with the first machine. The two planes now being built for the Curtiss Flying Service are being equipped with Curtiss C-6 engines. Hand inertia starters can be furnished at a moderate extra charge. The gasoline system is of the all-gravity feed type. The regular installation consists of two 35 gal. tanks, located one in each of the wings, and a reserve tank of 10 gal. capacity which is placed in the center section of the wing directly above the pilot's compartment.

When greater range is desired, this 10 gal. tank can be replaced by a 30 gal. tank, giving a total fuel capacity of 100 gal. At a cruising speed of 100 m.p.h. with the Wright Whirlwind engine, the 80 gal. system provides a range of about 550 mi. and the 100 gal. system a range of about 700 mi. The connections from the wing gasoline tanks are carried back to the hinge point around which the wings swing when being folded. A swivel type of pipe connection is provided in this position, thus eliminating the necessity of disconnecting gasoline lines when folding the wings. Special precaution has been taken in the design to ensure this swivel connection remaining absolutely gasoline-tight at all times. In addition, it is placed entirely outside of the body and wings.

The manufacturer's specifications for Model FC-2 are as follows:

	LANDPLANE	SEAPLANE
DIMENSIONS:		
Length over all	30 ft. 11 in.	32 ft. 5 in.
Height over all	9 " 0 "	11 " 4 "
Span	44 " 0 "	44 " 0 "
Height folded	9 " 0 "	11 " 4 "
Span folded	13 " 0 "	13 " 0 "
Chord	7 " 0 "	7 " 0 "
Angle of incidence	2° 2′	2° 2′
Dihedral	1° 2′	1° 2′
AREAS:		
Area of wing, inc. ailerons	290 sq. ft.	290 sq. ft.
Area ailerons	21.0 " "	21.0 " "
Area horizontal stabilizer	26.1 " "	26.1 " "
Area elevator	18.1 " "	18.1 " "
Area rudder	10.2 " "	10.2 " "
Area fin	5.1 " "	5.1 " "
POWER PLANT:		
Engine, Wright Whirlwind	200-220 hp.	200-220 hp.
Gasoline capacity (regular)	85 gal.	85 gal.
Gasoline capacity (special)	105 gal.	105 gal.
WEIGHTS:		
Weight empty	2,050 lb.	2,340 lb.
Net pay load with full tanks (85 gal.)	825 "	800 "
Net pay load with 3 hours fuel	1,100 "	1,100 "
Total useful load	1,550 "	1,560 "
Gross weight full load	3,600 "	3,900 "
Gross weight, light load*	2,800 "	3,100 "
Wing loading per sq. ft., full load	12.4 "	13.5 "
Power loading, per hp., (220 hp.)	16.4 lb.	17.7 lb.
Power loading per hp. (200 hp.)	18.0 "	19.5 "
PERFORMANCE:		
Maximum speed	122 m.p.h.	118 m.p.h.
Cruising speed (Approx.)	103 "	100 "
Rate of climb at ground, full load	565 ft. per min.	420 ft. per min.
Rate of climb at ground, light load*	950 " " "	740 " " "
Absolute ceiling, full load	13,000 ft.	10,500 ft.
Absolute ceiling, light load*	17,600 "	14,600 "
Service ceiling, light load*	15,200 "	12,700 "
Time to 10,000 ft. full load	33 min.	
Time to 10,000 ft., light load*	18.2 "	22 min.
Range at cruising speed, full load	710 mi.	650 mi.
Range at cruising speed, light load*	330 "	760 "
Range with 105 gal. gas.	1,000 "	920 "

*Light load is considered equivalent of pilot, two passengers and fuel for three hours flying.

N.A.C.A. Publishes Report No. 266

The National Advisory Committee for Aeronautics has published report No. 266 entitled "Air Force and Moment for N-20 Wing with Certain Cut-Outs" by R. H. Smith. The airplane designer often finds it necessary, in meeting the requirements of visibility, to remove area or to otherwise locally distort the plan or section of an airplane wing. This report contains the experimental results of tests on six 5 in. by 30 in. N-20 wing models, cut out or distorted in different ways, which were conducted in the 8 ft. by 8 ft. wind tunnel of the Navy Aerodynamic Laboratory in Washington in 1924.

The measured and derived results are given without correction for Vl/v or for wall effect and for standard air density, $p=0.00237$ slug per cu. ft.

Report No. 266 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Low Powered French Plane Sets New Record

A French report states that a new record for 40 hp. avionnette was recently made at Orly, France, when the plane covered a distance of 63 mi. (100 km.) at an average speed of 93 m.p.h. (152.82 km.). A 40 hp. Albert-Salmson plane also broke the previous record for altitude, attaining the height of 20,336 ft., or 6,200 meters.

German Air Transport

By LESTER D. GARDNER

This series of articles on German Air Transport is the result of a trip made by Major Gardner over the principal air routes of the Deutsche Luft Hansa last year. It has been supplemented by more recent data from various sources. The description of German Transport Planes has been taken almost entirely from an article in the May 7th issue of "Zeitschrift des Vereines Deutscher Ingenieure".—ED.

ARTICLE III

TO ATTEMPT to give a detailed diescription of flights over all the lines of the Deutsche Luft Hansa would require a book rather than a few pages. There are, however, certain general conclusions that may be reached by relating some of the experiences of an air traveler who had the good fortune to fly over most of the main air routes of Germany.

When the map of this company's airlines that criss cross the German Republic is studied with the thought in mind of flying over the important links, certain definite trips suggest themselves. A trip from Berlin to Copenhagen and a return flight from Stockholm to Stettin gives an experience in air travel over water in land planes and of how seaplanes are operated by this efficient German air line.

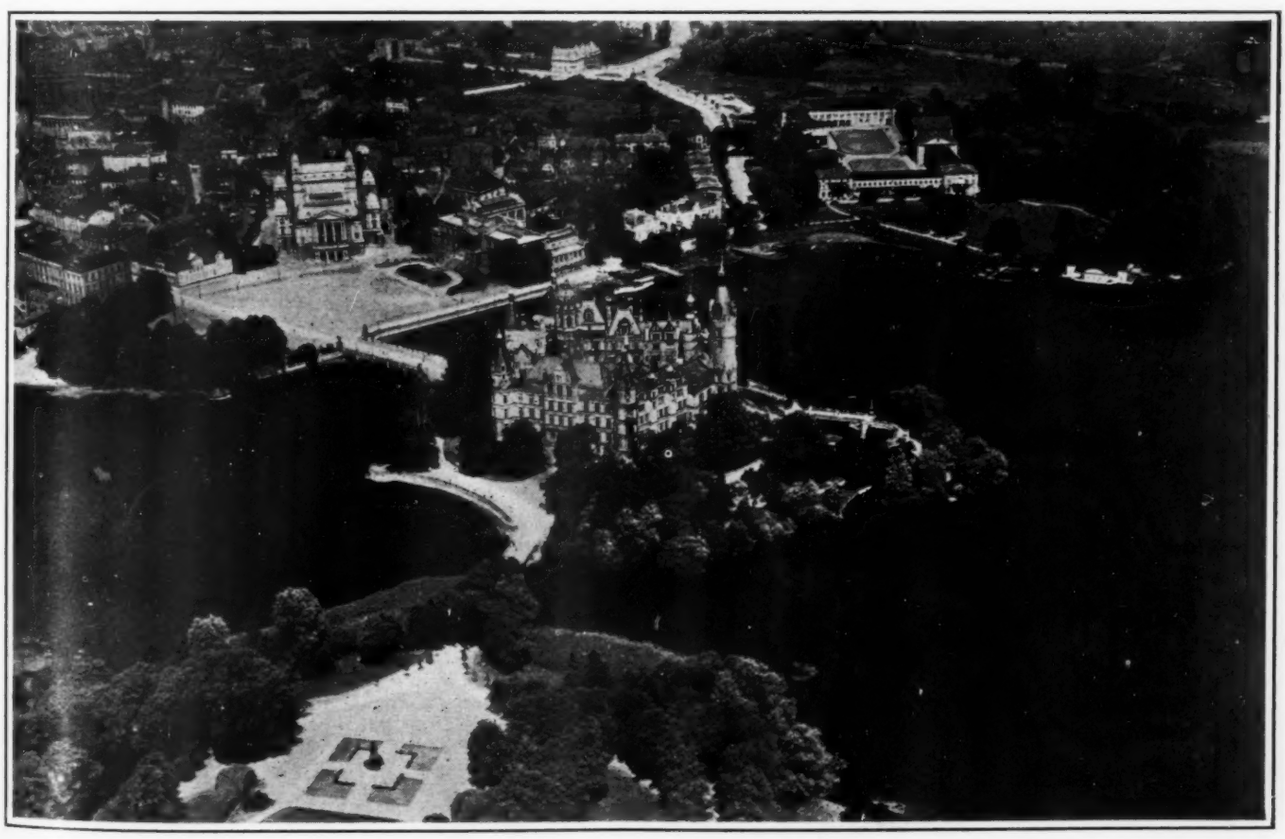
A trip from Berlin to Amsterdam and from there to Munich, via Cologne and Frankfort, gives a general idea of the uses made of different sizes of air transport planes for different kinds of traffic. From Munich, the southern air transport center of Germany, a delightful flight may be made to Zurich, Switzerland, passing over the famous Friedrichshafen Dornier airplane and Zeppelin airship factories. From Munich, the most picturesque flight in Europe starts. It only takes an hour but passengers from Innsbruck are usually flown back to the Bavarian capital by a direct route over the Alps—a trip that will ever be remembered.

A return trip to Berlin through Central Germany may be made in several ways. One may fly 150 miles east to Vienna and then fly north via Prague and Dresden, or he may fly directly north by way of Leipsic or Halle.

On reaching Berlin another round trip to Breslau, Koenigsberg and the Baltic seashore cities may be planned to obtain still another idea of the extent of the great system of German internal air lines.

The following account of an American gentleman's experience can be taken as a fitting illustration of the simplicity, efficiency and enjoyment of air travel in Europe.

At a lunch table at the Hotel Adlon in Berlin, a New York banker was asking questions about air travel. He wanted to know if it really saved time. It was Thursday noon. He was immediately invited to try an experiment for himself. He was told that at three o'clock a large three-engined Junkers plane left Templehof Field and reached Copenhagen, Denmark, in time for dinner, whereas, the train trip took all day or all night. He was told that he could leave Copenhagen the next morning at nine o'clock and dine with friends



The modern castle of Schwerin as seen from a Luft Hansa plane en route from Berlin to Copenhagen.

NATIONAL AIR RACES, SPOKANE, WASH., SEPT. 23, 24

in London that evening. And he could leave London Saturday morning and be in Berlin again early in the evening. To make this round trip by train would require constant day and night travel, changes from train to boat and many frontier difficulties. By air, the journey would be comfortable and demonstrate perfectly the advantages of air travel. The banker was so pleased with the possibilities of the trip that he decided to make the round trip.

Securing the tickets was an easy procedure as the ticket office of the Deutsche Luft Hansa is centrally located in Berlin. The auto bus left the office at two o'clock and reached Tempelhof Field before half past two. A few minutes were occupied with ticket examination, passport stamping, weighing and looking over the large numbers of air transport planes in the hangars. Six planes were on the field being unloaded or about to leave. At 2:48 the big Junkers was in the air heading northeast directly over the center of Berlin. It left early as all passengers were at the field. The banker became enthusiastic as it was his first flight. He looked down and pointed out the beautiful Tiergarten from which extends Unter den Linden, the main thoroughfare of Berlin. All the important buildings of the city could be seen for a few minutes, but soon the interest of the passengers was centered on beautiful Charlottenburg on the outskirts of Berlin.

Those interested in aeronautics were attracted by a large Zeppelin hangar in the distance. It was at the famous Staaken Airdrome where Zeppelin type airships were built during the War. Now, the huge hangar is used as a moving picture studio. There is also located the technical laboratories and flying school of the Deutsche Luft Hansa. Many more beautiful and interesting sights passed below until at last the banker was landed on time at his destination well pleased with his new and altogether profitable experience.

As is usually the case, the beginnings of flights are the most interesting parts of air journeys. To new air travelers, the scenery below is so fascinating that they do not pay any attention to the details of the plane itself until they get out over the countryside where the views are on a large scale with few objects of interest to attract attention.

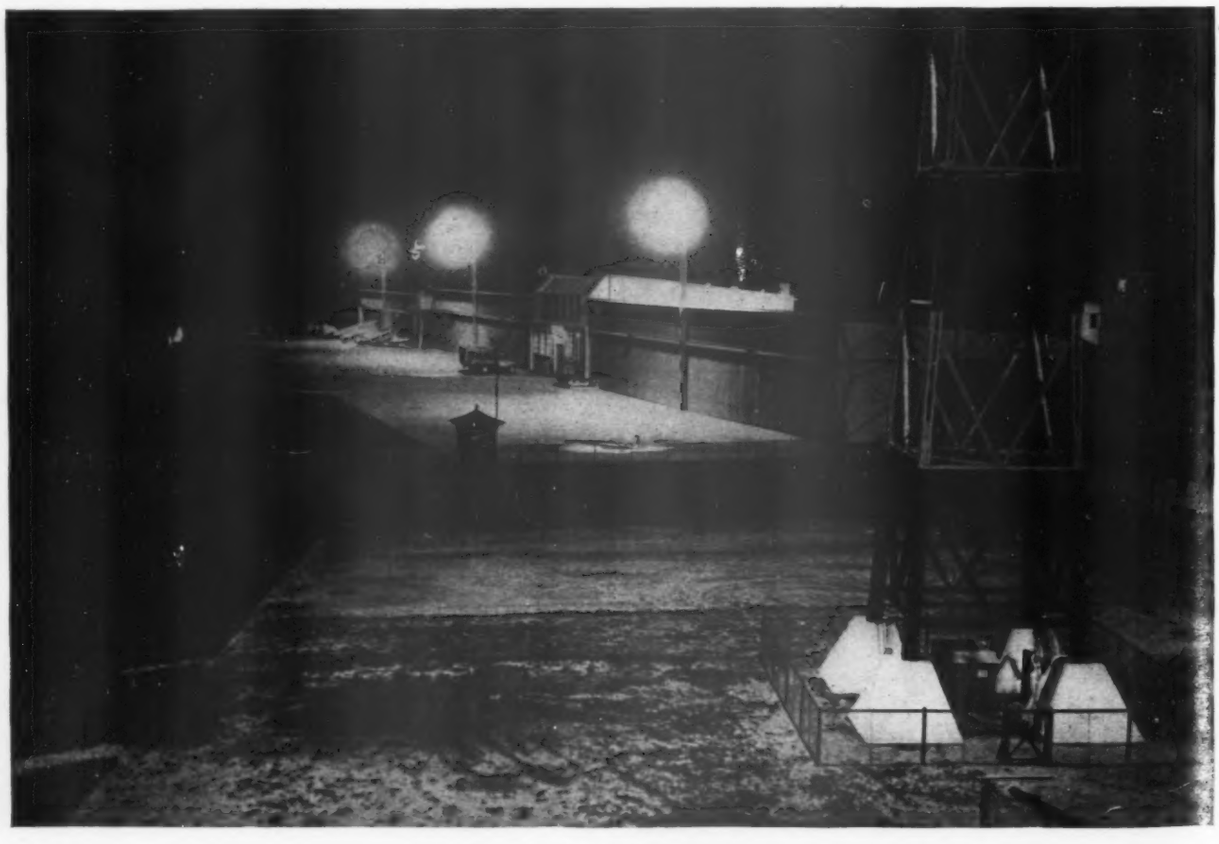
It is then that the details of the interior of the planes are studied. The large comfortable red leather chairs become more luxurious. The taste shown in draperies and carpets is noted and the eyes of the men soon locate the ash tray conveniently placed under the windows and cigars and cigarettes add to the air of complete relaxation.

The small wash-room in the rear of the plane is fitted with every convenience for the passengers. Whenever a lid is raised, the opening to the outside of the plane is automatically closed, an improvement which will be noted by experienced air travelers who have, on less carefully designed planes had unfortunate experiences in attempting to have direct contact with a wind stream of a hundred miles an hour.

Flying Instruments for Passengers

The racks for overcoats, hats and handbags are not designed for strength only but add to the attractiveness of the interior by cord interlacing. The forward seat of the plane has a writing table which swings down from the front bulkhead if desired. A typewriter may be used here also. Over the door leading to the cockpit is a clock, an altimeter and a speed indicator so that all the passengers may keep themselves informed as to the three thoughts uppermost in their minds all during the trip.

The pilot and mechanic pilot have a most convenient cockpit. They are located where the operating personnel of a passenger plane should be placed, ahead in the nose. The door to the cockpit is wide and the glass window gives the passengers a feeling of close contact with the men who are responsible for their safety, a point often overlooked in the



Tempelhof Airport, Berlin, at night.

PRACTICE WHAT YOU PREACH — USE THE AIR MAIL

Three famous Luft Hansa pilots. Left to right: Kricheldorf, Bauer and Wiskandt. Bauer was an ace in the War.

design of passenger planes. The second pilot on almost all large German planes will give passengers an opportunity to observe the arrangement of the controls and instruments and have the delightful experience of riding in the open. This is particularly enjoyed by women passengers who appear to be thrilled by the opportunity to ride in the open beside the pilot.

The sliding windows of the plane are adjustable and the old travelers all chose the rear seats for two reasons. They know that the opening of windows causes draughts on those in the rear, and when the weather is not warm and clear objections are naturally made by those who receive the full benefit of the wind stream. Therefore, those in the rear seats have a greater freedom of action with regard to ventilation. The other reason that causes them to choose the rear seats is that in case of forced landings or other difficulties the rear seat occupant usually comes through with less inconvenience, to put it mildly.

Receptacles for Airsickness Bags

On the back of each seat is a flap covering a pouch which holds airsickness bags. These bags are standard on practically every well equipped passenger plane. They are lined with wax paper and several are provided for each passenger for each trip, for it has been found that when one is required, three or four make their use much more pleasant. Airsickness is one of the great unsolved problems of air transport but, there are many remedies for those who are so afflicted, and so there should be no more objection to air travel for this reason than similar experiences on ocean ships. Ventilation and warmth are the two essentials that are particularly noticeable on German air transport planes and they minimize the discomfort during rough weather.

The noise from the engines on the large three-engined Junkers planes is not as deafening as on many other types, due to the carefully worked out tufting on the interior. The entire inside of the cabin is lined with a thick stuffing covered with gray whipcord. This deadens the sound which otherwise would be very penetrating owing to the metal frame of the fuselage. But usually all passengers use the cotton which is furnished to place in the ears. Ear defenders, such as are used on battleships for protection against ear shock from gunfire, will be found to be better than cotton, the advantages being that they are cooler and one can hear normal sounds and conversation clearly. They can also be used many times —another good point.

On the flight from Berlin to Copenhagen a landing is made at Lubeck. Perhaps a few paragraphs from the writer's diary entered while on the plane will give a clearer idea of what a passenger sees, hears and does on these air trips in Germany:

"The sky is almost cloudless. There is practically no wind. Our pilot's name is Wiskandt, one of the best known commercial pilots of the Deutsche Luft Hansa. His mechanic-pilot beside him holds a map of the course, which passes over two rollers. It is being used constantly. The slight haze gives a visibility of about twenty miles. We have been about fifteen minutes in the air. To the right is Spandau the great manufacturing suburb of Berlin where the great electrical works are located. The plane is riding a few bumps, but it is not rough. My friend and I are the only passengers this afternoon. He is enjoying a cigar while I smoke my pipe. There are seats for nine in the cabin. We change seats occasionally so that we may get views on either side of the plane. The altitude averages about 1,500 feet, and the speed is 100 miles an hour. My friend paid about $20.00 for the trip of 361 miles or about 5½ cents a mile. This cost is about the same as the rate for first-class railway fare and sleeper. We were given attractive stick pins by the Luft Hansa page as we took-off. All passengers receive them. They are reproductions of the conventionalized bird used as a trademark by the Deutsche Luft Hansa. The scenery is very monotonous as we are flying over farming country. Lakes and irrigation canals are to be seen frequently. There are few automobiles on the roads as there are only 500,000 cars in all Germany.

The River Elbe is Sighted

"In the distance we can see the large River Elbe. Clouds at about 6,000 feet shield us from the glare of the sun. We have been flying an hour and expect to reach Lubeck in three-quarters of an hour more. The plane is very warm and we are not wearing our hats. There is a rain cloud to be seen to the north. The pilot has changed his course and is flying around the rain. We fly over Schwerin, a city of about 50,000 people, beautifully located on a very large lake. We can see the cathedral and old castle located on an island, while opposite is a typically beautiful municipal theatre. But we are more interested in a flying field with a hangar that looks large enough to have been used as a Zeppelin shed. A beautiful rainbow is below us. It is the first time we have ever looked down on one. The pilot obligingly comes down to about 400 feet, so that we can get a good view of the city. It has only taken about fifteen minutes for us to fly near enough to the sea to get our first view of the Baltic. The weather has changed and the ground below looks very wet in places, indicating recent rain. The pilot by skillful maneuvering has avoided the rain. We are now flying over a

small bay, and can see Lubeck in the distance. The airport is located on an island to the south of the city. Fine beaches with summer hotels are to the north. We make a three point landing at 4:49, two hours after leaving Berlin.

"We take-off at 5:08. While at the field my friend and I enjoyed excellent beer and cheese of the country. The Caspar aircraft factory is located there, but was closed. Mail for Denmark was put on the plane as a great saving in time is made by using airplanes on the next leg of the trip to Copenhagen. It is now raining hard and we wonder if we are to miss seeing the beautiful crossing of the sea to Denmark. Fortunately we have a good tail wind. We have just flown near the city of Lubeck and had a good view of it. We read in our guide book about the city. It was one of the free Hanseatic towns. It is from this league that the Deutsche Luft Hansa or German Air League or Association takes its name. No air trip is complete without a good gazeteer to read.

A Thirteen Mile Water Crossing

"We soon reach one of the bays of the Baltic and are following the shore of a peninsula to make the crossing to the Danish Islands shorter. We have again reached 1,500 feet and our speed is about 100 miles an hour. The rain has stopped and clouds float below us. At 5:28 we cross to the Island of Fehman, but in ten minutes we head out to sea for a water crossing of thirteen miles to the Danish Island of Laaland. We can see across the Straight and as the sky has cleared, we are enjoying a beautiful sight. Several sailing vessels can be seen, making the view very beautiful. The sea is calm. As we near Denmark a shoal may be seen extending for miles. It gives the water a very light blue appearance. Our first view of this prosperous country is very interesting. Large islands are to be seen and all are dotted with lakes, some very large. The character of the country side may be recognized by the large white dairy barns with red roofs. Occasionally we cross a railroad. There is a train going north.

"We are now over the mainland of Denmark. We have seen few towns, but everywhere there are dairy farms. At 6:18 we reach the bay on which Copenhagen is located. As it has become quite dark, we take a short route directly across the bay. All along the shore are summer resort villages. The city is to the north, and we soon reach Kastrup Airdrome which is located several miles from the city on the strait that divides Denmark from Sweden. Across this five mile stretch of water is Malmoe, the terminal of the air line, where a change may be made for the night train to Stockholm or Oslo. We land at 6:36 having flown 361 mi. in 3 hr. and 29 min."

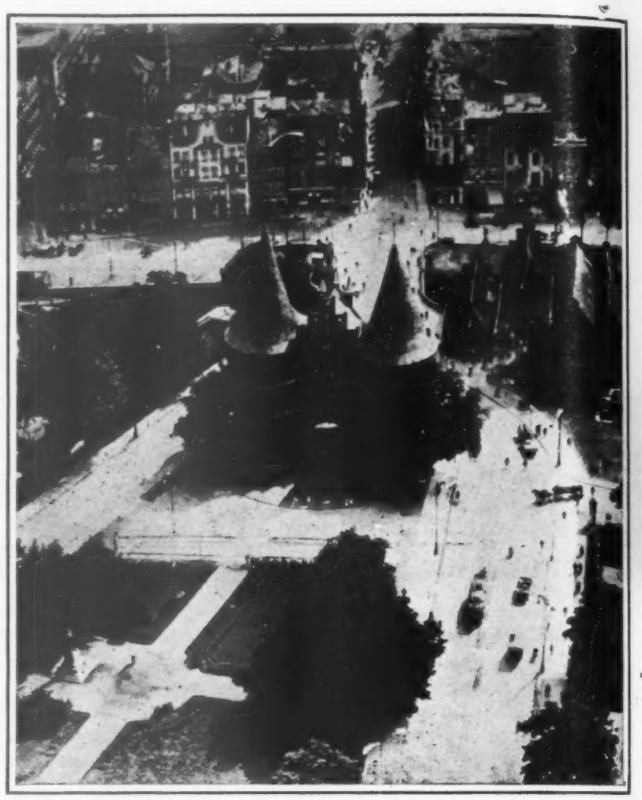
Customs and Passport Inspection

On landing the air traveler finds a very well equipped office building and is quickly passed by customs and passport officials. The assembly plant of the Rohrbach Aeroplane Co. is located at this field. There is a motor bus to take the passengers who fly from London, Paris, Amsterdam, Bremen and Humburg. When it is too dark to fly to Malmoe, passengers for Stockholm are taken to the ferry. Others were taken to their hotels.

The airdrome at Copenhagen is operated by the Aerotransport A.B., the Swedish air transport company and the Danish Air Transport Co. in cooperation with the Deutsche Luft Hansa. By combinations such as this the air lines of three countries join in maintaining air traffic. It is perhaps the best illustration in Europe of the difficulties that the air transport companies have to overcome in operating over territory near borders.

The following is a description of the continuation of this air tour made by the writer and his guest.

The next day, after a very delightful evening in the interesting capital of Denmark, we flew to London via Amsterdam, dined with Charles Grey, editor of "The Aeroplane", and on Saturday flew back to Berlin, exactly as planned. But as this account is of a round trip, via Stockholm, and as we flew later to Copenhagen from Casablanca in Africa, via Barcelona, Spain, Marseilles, Paris and Cologne, we will cross to Malmoe and take the night train to Stockholm. There is no air service across Sweden, but as the night trains are excellently equipped it is a very pleasant ride.



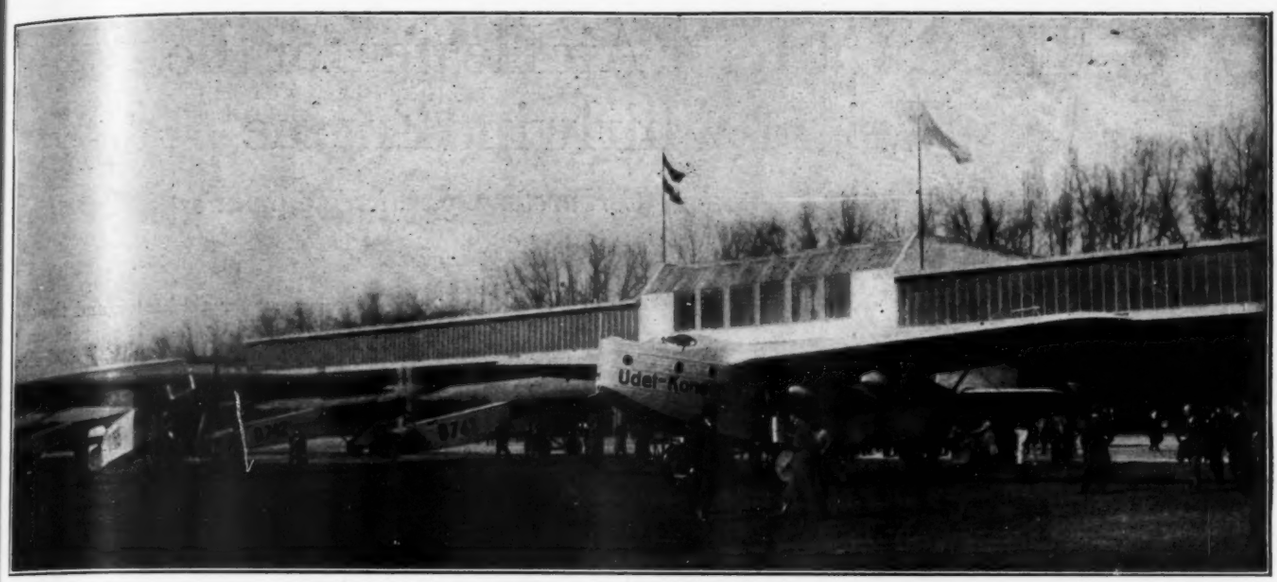
The Holsten Tor at Lubeck—a mediaeval fortified gateway dating from 1477.

In the morning, after a pleasant drive about the city, my guest, Col. Henry D. Lindsley, first National Commander of the American Legion, and I drove to the airport of the Deutsche Luft Hansa located on a beautiful bay several miles north of the city. Here Luft Hansa seaplanes leave for Stettin, Germany, and those operated by the Swedish Aktie Bolaget Aerotransport and the Aero O. Y. of Finland, fly to Helsingfors. The German line uses Dornier Wal flying boats, while Junkers seaplanes are used for the flight across the Baltic to Finland.

Reach Berlin in Time for Dinner

As we reached the station the large Dornier Wal was being serviced for the 399 mi. over-sea trip to Stettin, where we were to be met and flown 81 mi. to Berlin, in time for dinner. We were due to leave at 11:30 A.M., but did not take off until 11:55. After a short taxiing we took the air at 12:01. As we had flown from Genoa to Palermo, Italy, in a Dornier Wal, its comfortable cabin and excellent unobstructed view were not as impressive as they are to passengers who fly in these seaplanes for the first time. Our pilot, C. Ruring, decided to give us a flight that would never be forgotten from both a scenic and speed point of view.

He headed directly for the city and flew over this Venice of the North. There is probably no city in the world that is so beautiful from the air as Stockholm. It is truly called "The City within the Bridges". As far as the eye can see in all directions are small and large lakes surrounded by forests. As the day was clear this view could be seen for fifty miles. It is not necessary for a seaplane to fly close to the sea in Swe-



Planes of the Luft Hansa lined up on the Tempelhof Field, the Berlin airport. The four-engine Udet airliner can be seen in the foreground.

den, as it could land almost anywhere on a lake. In a half hour the sea was reached and here again a unique view was encountered. The shore is dotted with thousands of islands and the combination of forests, lakes, sea and islands makes flying in Sweden an experience not duplicated elsewhere.

By 12:30 the plane was flying over the sea and we were treated to a new experience. As we had left a little late and were flying against a head wind, the pilot, who wished to save time, flew at about ten feet above the surface of the water. As the sea was choppy, at the speed of about 90 m.p.h., we appeared to be going faster than we had ever flown before. It was more exciting than hedge hopping, because of the length of time that the pilot maintained this ten foot altitude. For over two hours he held his plane constantly at this height and the impression of speed is gained even to a degree greater than that of any speed boat. To fly over the sea, out of sight of land, with the spray from the white caps blowing into the winds, gives passengers a thrill as no other kind of flying does. We flew parallel to the coast about ten miles out, and only occasionally could land be seen. We passed the island of Gothland and could see the beautiful summer villa of the Queen of Sweden.

Fly Over Castle of Kalmar

We landed at Kalmar at 2:42 and enjoyed a very welcomed lunch. At 3:23 we were in the air again and flew over the ancient Castle of Kalmar with its five towers and ramparts which had withstood twenty-three seiges. As we reached open water, the pilot again tried "wave hopping". He told us at Kalmar that he could only do it when he had a good head wind, because if his engines commenced to miss he had plenty of reserve flying speed to climb. Of course, he found the wind easier to buck close to the water.

After leaving Kalmar we took a straight course for Stettin, Germany. This gave us a direct over water flight of about 125 mi. The only land we sighted was the Island of Bornholm which we passed about three miles to the West of our course. Occasionally we would pass steamers and sailing vessels, and would exchange greetings with those on board. It was not until after six o'clock that we landed on the River Oder. As we wished to get to Berlin as quickly as possible, we were taken by automobile from the seaplane station on the river to the flying field where a special plane was waiting for us. We did not reach the field until after seven o'clock and left at 7:20. The sky had commenced to get dark and as we knew that the L.F.G. plane in which we were flying could not make over 60-70 m.p.h., we surmised that we would probably have to land at Tempelhof Field in the dark. It took an hour and twenty minutes to cover the eighty-one mile flight, and we had the interesting sight of Berlin in the early evening with thousands of lights twinkling below. The city was more beautiful than when seen on the night flight toward Moscow, as there were many more lights.

A dinner had been arranged in honor of Colonel Lindsley and even though we did not land at Tempelhof Field until 8:40 P.M., we reached the dinner at an hour that is not late for Berlin.

Among the guests were Mr. Otto Merkel, Maj. Martin Wronsky and Dr. Erhard Milch, the directors of the Deutsche Luft Hansa; Dr. Knauss who was about to leave for the famous flight from Moscow to Pekin; Dr. P. Fette, director of the Deruluft air line between Berlin and Moscow; Major von Tschudi, secretary of the Aero Club of Germany and host to all visiting aeronautical guests, and Dr. Fritz Hammer, director of the S. C. A. D. T. A. air line in Columbia, South America.

In the next part a further description of flying over Germany will be given. This will include an account of a flight over the Alps from Innsbruck.

New West Indian Airline Starts Oct. 1

In a recent announcement, H. N. Hansard, vice-president of the West Indian Aerial Express, of Santo Domingo, stated that a system of aerial transportation which will link North and South America through the West Indies will begin operation on Oct. 1.

The company will operate a passenger, freight and mail airplane service between Havana and Trinidad and, through the seaplane service now in operation across the straits of Florida, will be the means of connecting the two continents.

The first of the fleet of planes to be used on this service is now being constructed by the Keystone Aircraft Co. at Bristol, Pa., and is expected to be completed by the end of August. It will be christened the Santa Maria and will be equipped with three Wright Whirlwind engines. It will have a high speed of 112 m.p.h. and will carry ten passengers, baggage and mail.

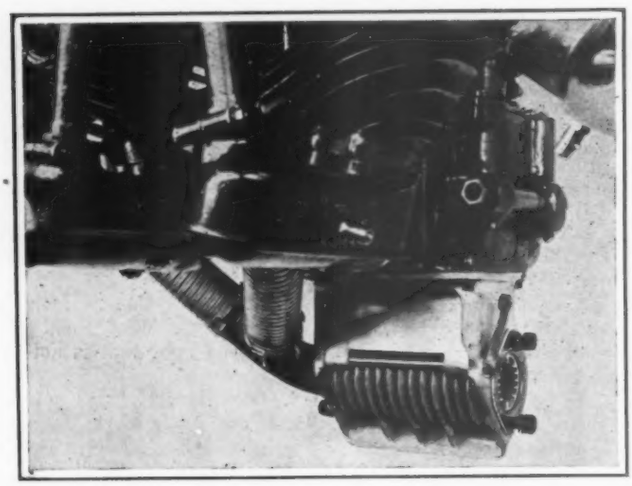
Mr. Hansard said that the cost of aerial transportation would compare favorably with steamboat fares between the islands.

The Carburetor Air Heater for the Wright Whirlwind Engine

A Development to Eliminate Carburetor Operation Difficulties

By P. B. TAYLOR*

THE PROBLEM of carburetion on the Wright Whirlwind engine is intimately connected with the quality of fuel used. With the best grades of aviation gasoline no difficulty is experienced with the smoothness or acceleration of the Whirlwind engine at any speed and it is possible to run on extremely lean mixtures. With the poorer grades of aviation gasoline a hesitation in acceleration is noticeable and rough running is obtained usually between 1400 and 1600 r.p.m. on a propeller which turns 1800 r.p.m. at full throttle.



The Wright carburetor air intake heater, showing the cast aluminum fins inside and outside the passage for hot exhaust gases.

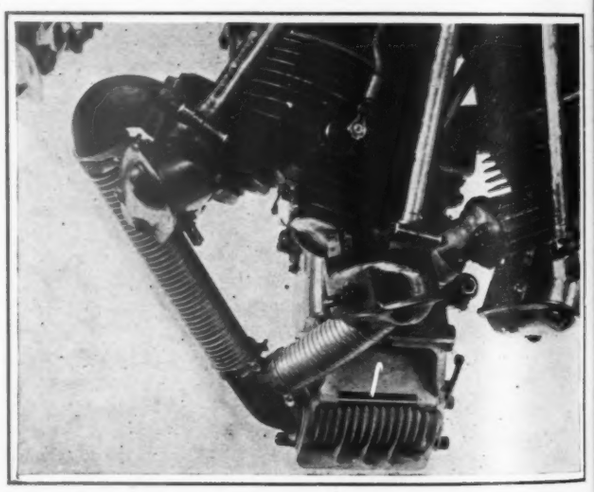
In cold weather this condition becomes worse and can be only partially prevented by the use of rich mixtures.

The presence of ice in the carburetor is another source of annoyance and even danger to the pilot. When the humidity is high, even in hot weather, the evaporation of gasoline drops the temperature of the mixture below the freezing point and the moisture contained in the air condenses on the manifold walls and freezes. This ice gradually builds up and chokes off the manifold passage, eventually stopping the engine.

To eliminate the operating difficulties mentioned above a carburetor air heater has been developed. This heater consists of an aluminum casting which bolts directly to the carburetor flange. Incorporated in the casting is a passage for exhaust gas which runs horizontally at right angles to the engine crankshaft. This passage is finned on both the inside and outside to obtain the maximum heat transfer from the exhaust gas to the intake air. Above the heating element a valve is fitted which when open will shut off the air passing the heating element and open a port admitting unheated air to the carburetor. The exhaust from cylinders No. 5 and 6 is brought together in a double elbow bolted to one end of the air heater. The exhaust gas passes through the casting, at the other end of which studs are arranged for a flange fitted with a pipe to discharge the exhaust gas into a manifold or into the slip stream as desired. The exhaust connections to the heater are made with elbows of steel tubing welded to the exhaust flanges. The elbows are so designed that a straight piece of flexible metal tubing can be clamped between the elbow on the carburetor air heater and the elbow on the exhaust port. The flexible tubing is secured on the ends with hose clamps which bind it tightly to the steel elbow.

The bypass valve in the heater is designed to close at part throttle so that the maximum amount of heat is utilized up to the full throttle position. At full throttle the valve is opened and the carburetor operates with no heat; thus the maximum power of the engine is unaffected by the use of the heater. The effect of heat at part throttle is to reduce the volumetric efficiency and thus slightly reduce the power for any given throttle position. This has exactly the same effect as a slightly smaller opening of the throttle valve except that the heat supplied vaporizes the incoming fuel and causes better distribution to all cylinders; thus the effect of the heater is to slightly improve the fuel consumption due to better distribution. The power of the engine is not affected as the throttle can be set to a slightly greater opening to compensate for the loss of volumetric efficiency.

The weight of the heater and piping is 7.0 lb. This includes the elbows and flexible tubing, some of which would be duplicated if exhaust manifolds were fitted. Considering the greatly improved performance and reliability of the Whirlwind engine due to the use of this heater, the added weight is considered insignificant.



Showing the two exhaust elbows, the flexible metal hose, the hose clamp and the steel tubing Y attached to the Wright carburetor air intake heater.

This heater is now furnished as standard equipment on all J-5 Whirlwind engines but cannot be adapted to the J-4B or earlier types of Whirlwinds due to a change in carburetor model.

Assistant Engineer, Wright Aeronautical Corp., Paterson, N. J.

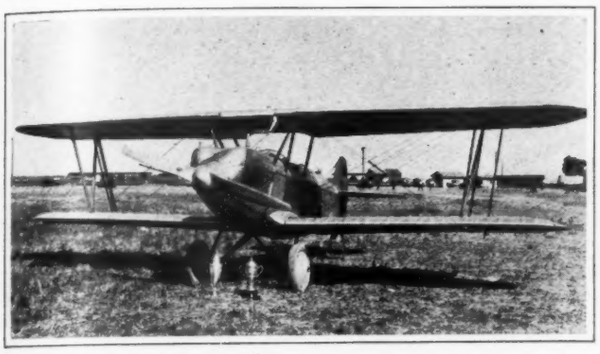
New York and Western Airways Inc.

New York and Western Airways, Inc., has been incorporated under the laws of New York state. The officers are Merrill K. Riddick, president; E. Root Dungan, secretary, and Charles R. Clapp, treasurer. The company intends to maintain a flying service, to develop air routes and to develop a landing field with hangars, machine shops, etc.

The OX-5 "Thunderbird" Airplane

After a year of thorough testing during which time it gave a highly efficient performance winning several races at local air meets the "Thunderbird" airplane designed by Theodore A. Woolsey of Los Angeles, Calif., has been placed on a production basis.

Flying over a three mile triangular course at the recent Santa Ana Air Meet races with Lieut. "Clint" Burrows at the controls the Thunderbird, powered with an OX-5 high compression motor won the event achieving what is claimed



Front view of the "Thunderbird" designed by Theodore A. Woolsey of Los Angeles, Calif., and powered by an OX-5 engine.

as a world's speed record for commercial planes of 100 hp. Attaining a speed of 114 m.p.h. on the short straightaway this airplane completed the race with an average speed of 93.7 m.p.h.

Among the special features incorporated in the construction of the Thunderbird are: Steel tube fuselage; split type landing gear; stearable tail skid; adjustable stabilizer; detachable nose mount; individually controlled ailerons; concealed flipper horns and neatly streamlined wing stup fairing.

The plane has been flown by army, navy and marine corps pilots who have commented favorably upon its performance. Lieut. Clint Burrows is test pilot for the Thunderbird company.

The General dimensions of the Thunderbird are:

Span	33 ft.
Length	25.5 ft.
Area	300 sq. ft.
Chord	5 ft.
Weight (empty)	1300 lb.
High speed	114 m.p.h.
Cruising speed	95 m.p.h.
Landing speed	32 m.p.h.
Ceiling	15,000 ft.
Fuel capacity	43 gal.

Curtiss Reed prop.

Mail Sack of the "America" is Returned

The mail sack which was carried n the Fokker monoplane "America" by Comdr. Richard E. Byrd, U.S.N., on his flight from New York to France, has been returned to the office of Acting Postmaster General W. Irving Glover. The sack which contained 293 letters, weighing four pounds and thirteen ounces net, was one of the new style foreign sacks with closing, sealing and labeling device attached and was addressed to "PARIS, FRANCE per Airplane 'America'".

The sack of mail was saved from the damaged plane "America" at Ver sur Mer, France, and delivered to the French postal authorities at Ver sur Mer on Saturday morning, July 2, by the Prefect of Cherbourg to whom it was delivered by Commander Byrd in the presence of the American Consul Wiley on Friday night, July 1. Mail was then delivered to addresses in Paris on July 3.

In the "Bulletin of Verification" which was carried in the mail sack this greeting was sent by the postmaster and employees of the New York City post office to the postmaster livered to addressees in Paris on July 3.

"The postmaster and employees of the New York post office send greetings to the postmaster and employees of the Paris post office on this, the occasion of the First Direct Air Mail Service between New York, U. S. A., and Paris, France. Please return the sack and label covering this dispatch under separate cover with this Bulletin of Verification as the equipment is desired for a special purpose. A duplicate of the Bulletin of Verification is attached for the files of your office."

In acknowledging the greetings from the New York office the postal officials at Ver-sur-Mer sent the following:

"The postmaster and postal employees at Ver Sur Mer, Calvados, France, where the airplane 'America' landed in the sea on July 1, 1927, acknowledge receipt of the greetings from the postmaster and postal employees at New York and in turn address their sincere greetings and felicitations on the occasion of the inauguration of the first air mail dispatch received directly in France coming from the United States."

It is planned to place this mail sack in the National Museum in Washington.

The First Test Flight

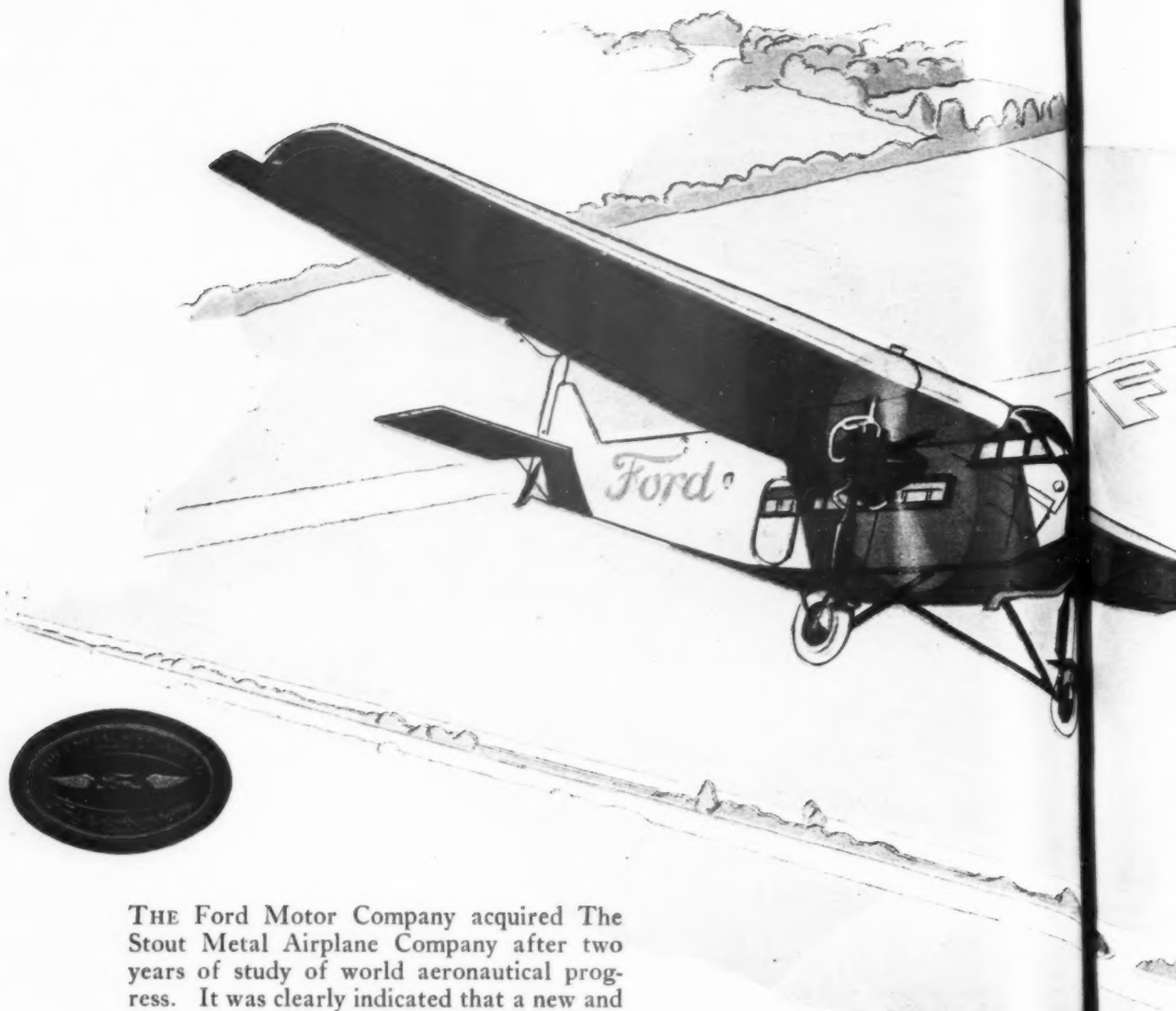
Photo of the first test flight of the Fokker monoplane (450 hp. Jupiter) "Old Glory" in which Lloyd Bertaud and James DeWitt Hill will shortly attempt a non-stop flight from New York to Rome.

Instructors Needed

The Air Corps Technical School, at Chanute Field, Rantoul, Ill., has at present two vacancies for instructors. One instructor is needed in airplane engine mechanics and two in the subject of airplane mechanics. Applicants for these positions must show evidence that they are thoroughly familiar with airplanes or airplane engines from both a theoretical and practical standpoint and that they have had sufficient education to properly impart their knowledge to students.

Further particulars regarding these positions can be secured by addressing the Office of the Director, Department of Mechanics, Air Corps Technical School, Chanute Field, Rantoul, Ill.

The interest and resources of the Ford Motor Company are behind the development of commercial aviation



THE Ford Motor Company acquired The Stout Metal Airplane Company after two years of study of world aeronautical progress. It was clearly indicated that a new and vast industry could be built up around the airplane.

The Stout Metal Airplane Company had, at that time, spent six years developing an all-metal monoplane that had shown extraordinary performance in passenger work. It was the only all-metal plane built in America; moreover, it was admirably suited, in many ways, to Ford methods of production.

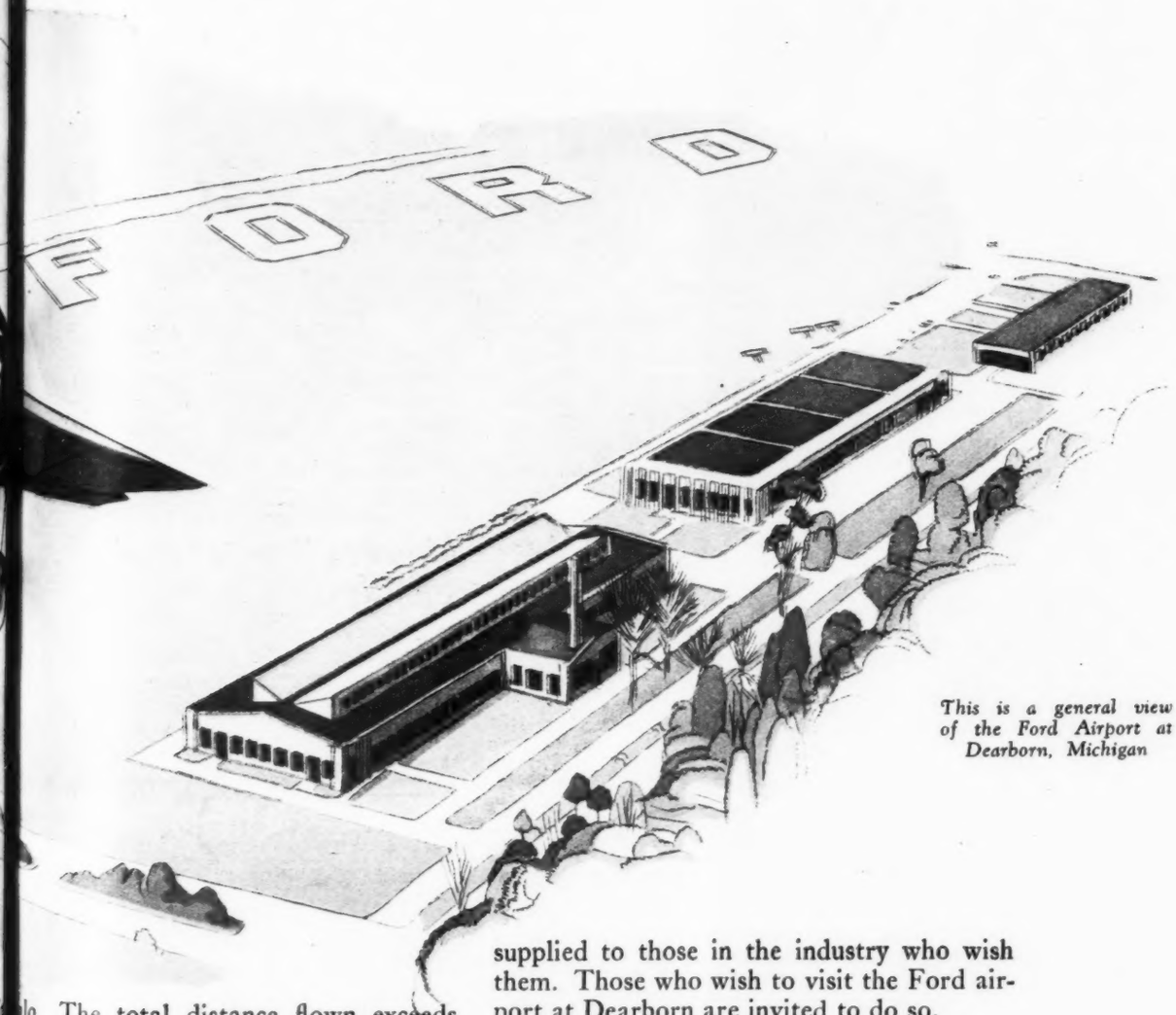
With every resource of the Ford Motor Company to draw on, the Ford monoplane quickly reached a very advanced point of efficiency, reliability and safety. Every step has been proved under the merciless tests of actual work on a strictly commercial basis.

Operations over the air routes of the Ford Motor Company, during a period of a little more than two years, show the following performance records:

Trips scheduled	2,874
Trips completed	2,783
Forced landings	
acc. weather	51
acc. mechanical	30
Flying hours	5,687
Miles flown	507,670
Freight (in lbs.)	3,062,044
U. S. Mail (in lbs.)	9,885

These operations have been carried on daily linking Detroit with Chicago, Cleveland

tor Company *are squarely behind the production of the* Ford monoplane



This is a general view of the Ford Airport at Dearborn, Michigan

lo. The total distance flown exceeds ty trips around the world. This has been in all weathers and all seasons.

evitably we have learned much about , earnings, organization and mainte- of air-lines. The results of this experi- are available to those now operating or mplating air-lines.

rther information gained from technical riments conducted by the Ford Motor pany may also be obtained. Facts and s relating to accomplishments in com- ial aviation, both in construction and peration of commercial planes, will be supplied to those in the industry who wish them. Those who wish to visit the Ford airport at Dearborn are invited to do so.

We will be glad to mail you, without cost or obligation, our new thirty-page booklet which contains a statement of the relationship of the Ford Motor Company to aviation; suggestions on the organization and financing of air-lines, based on operating experience; general information about landing fields; illustrations and descriptions of the Ford monoplane, and much additional material. It will be sent at your request.

THE STOUT METAL AIRPLANE CO.
Division of Ford Motor Company
Dearborn, Michigan

Aircraft Trade Notes

The Fry Super-Twin Gasoline Pump

The Fry Super Twin has a combination of new features never before found in any one gasoline pump, but the interest to aviation users is in the one feature having to do with the continuous discharge by pressure of the new Super Twin. All visible pumps, prior to the Fry Super-Twin have discharged by gravity. This feature, due to the location of the gasoline tank on an airplane, has rendered them practically useless so far as an airplane is concerned. Even when filling from a pump was possible, where the hose has been in a looped position, air traps have formed in the hose causing slow delivery.

In the Fry Super-Twin the discharge from the pump is not by gravity; it is by pressure. When one cylinder is filling, the air contained in that cylinder is forced through a by-pass into the top of the cylinder that is discharging, thus forcing the gasoline out through the hose. This passing of air from one cylinder to another during the process of operation, provides a continuous stream from the nozzle and makes it possible to fill any tank without diminishing the speed of operation. The problem of slow delivery from a visible pump is completely met by the Fry Super-Twin pressure discharge feature.

The Fry Super Twin gasoline Pump.

Other features of special interest in the Fry Super-Twin are the following: In all previous pumps, with indicators attached, nothing has been provided to prevent the operator from serving a new customer without having first returned the indicator to a zero position. The operation of the Fry Super-Twin insures that delivery to each customer will be indicated progressively, beginning at zero. The indicator is so interlocked with the pump mechanism that after delivery has been completed to a customer, the pump is automatically locked and cannot be operated until the indicator has been returned to zero. The indicator records the gallons delivered and it records them only after delivery has been made. Only that portion of the liquid which passes through the hose is recorded. Gasoline returning to the under ground storage tank is not recorded.

Since the beginning of the pump industry, there has been an insistent demand for a meter that could be relied upon.

The Fry Super-Twin must deliver an accurate gallon or else it will not operate because one of the cylinders must first be filled and the gasoline "packed" into it before the valve mechanism will reverse itself and start delivery from that cylinder, and the filling of the other cylinder. It is therefore obvious that a full gallon, and only a full gallon, can be delivered, for if the cylinder is not filled completely, the valve will not reverse to start delivery from that cylinder.

The problem of accuracy in this pump is reduced to the simplest terms. After the cylinders are once calibrated to hold a gallon, they will always deliver a gallon—ACCURATELY. No customer can be deceived concerning the quantity of gasoline received. When a gallon of gasoline has been measured a delivery has been started to the airplane. There is only one place for it to go and that is to the airplane until after the hose has been again hung up. As long as the hose is in the tank, the measured gallon is going through the hose and into the tank only. There is no such thing as diversion.

C. W. A. Inc., is Awarded New Mail Contract

The Colonial Western Airways, Inc., of New York, John F. O'Ryan, president, has been awarded the contract for carrying mail by air between Albany, N. Y., and Cleveland, O., via Schenectady, Syracuse, Rochester, and Buffalo.

Of four bidders the bid of the Colonial Western Airways of $1.15 per pound was low by 11 cents.

It is expected that the company will begin operation within three months, using at least five cabin type monoplanes with either Wright J-5 or Pratt and Whitney "Wasp" engines, with a speed ranging from 100 to 140 m.p.h. Acting Postmaster General W. Irving Glover has been advised that the company has a contract with the American Railway Express Co. and that both mail and express will be carried from the inception of service.

The flying schedule is as follows:

Albany, via Schenectady, Syracuse, Rochester and Buffalo, N. Y., to Cleveland, Ohio, and return. Distance each way is approximately 452 mi.

Westbound		Daily Schedule		Eastbound
11:00 A.M.	Lv.	Albany, N. Y.	Ar.	5:30 P.M.
11:15 A.M.		Schenectady, N. Y.		5:15 P.M.
12:35 P.M.		Syracuse, N. Y.		3:55 P.M.
1:35 P.M.		Rochester, N. Y.		2:55 P.M.
2:25 P.M.		Buffalo, N. Y.		2:05 P.M.
4:15 P.M.	Ar.	Cleveland, Ohio	Lv.	12:15 P.M.

New Aero Engineering Firm is Formed

Glenn M. Pike, formerly of the U. S. Air Service, announces the formation of the Aeronautical Engineering Co., with offices at 527 Fifth Ave., New York City.

The new company is engaged in the reconditioning of planes, the construction and equipping of airports and landing fields, and in handling all forms of aircraft insurance.

It is stated that the company is assisting in the development of a new type of monoplane which is to be powered by a new type of radial engine.

The Austin Co. Gets New Hangar Contract

The Thompson Aeronautical Corp., of Cleveland, O., a subsidiary of the Thompson Products, Inc., has placed a contract with The Austin Co. for the design and construction of a new hangar building to be built at the Cleveland airport.

The new hangar, which is to cost $25,000, is of brick and steel construction, 70 x 100 ft., having a 70 ft. clear span.

The Thompson Aeronautical Corp., of which E. G. Thompson is president, is as well known as the firm which manufactures the valves used in Colonel Lindbergh's plane, this firm making all valves for the Wright Aeronautical Corp.

Robertson Aircraft Corp. to Erect Factory

The Robertson Aircraft Corp. holder of the St. Louis-Chicago air mail contract has announced that it will soon erect an airplane factory in St. Louis.

The planes to be built at the Robertson plant will be capable of carrying two passengers and the pilot, and will be powered by the OX5 Curtiss engines recently purchased from the Curtiss Airplane & Motor Co., of Garden City, L. I. Later on it is contemplated to construct larger planes which will be powered by one and three Wright Whirlwind engines.

Speed May Decide the Dole Derby

As AVIATION goes to press final preparations are being made for the Dole Derby (North America-Hawaii) starting at noon Aug. 12, and from all indications speed will be the deciding factor in the race for the prizes of $35,000 for the first and second pilots to complete the flight. Even as this item is being read, it is quite possible that news of the safe arrival of the winners will have been received from the islands in the mid-Pacific.

The competition for the Dole prize will be a "race" in every sense of the word and perhaps the most remarkable and thrilling race since the dawn of human reckoning, for between seven and twelve airplanes are to take off at given intervals from the Pacific Coast on the 2425 mile flight to Honolulu starting at high noon.

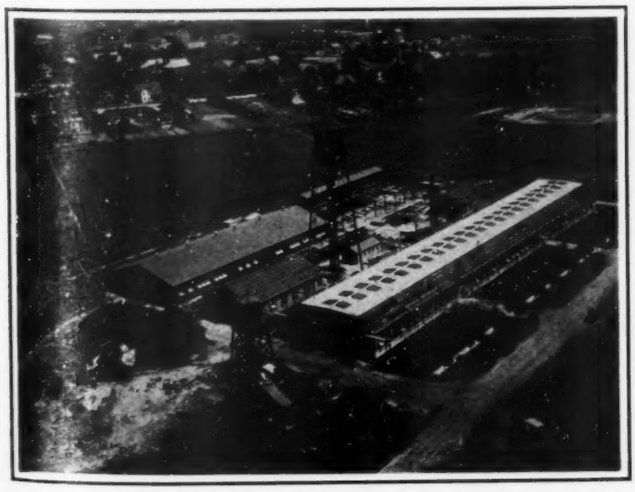
Oakland, Calif., will witness the departure of the greater number of planes. The specially prepared runway, used by Maitland and Hegenberger and Smith and Bronte is the most ideally suited starting point on the West Coast. If the contestants are favored by reasonably good weather, and have proper navigation it will be the fastest plane that wins as present indications are that every plane in the race will be in the air an hour after the contest opens.

At the date of writing the following entries have been officially made according to Capt. Charles H. Babb, secretary of the Southern California chapter of the National Aeronautic Association:

Pilot	Navigator	Type of Plane
Bennett Griffin	Al Henley	Travel Air Monoplane
Lt. Art C. Goebel	None	Travel Air Monoplane
Lt. John W. Frost	Gordon Scott	Lockheed Monoplane
John Augie Pedlar	Manley R. Lawing	Buhl Airsedan
Maj. Livingston G. Irving	None	Breese Monoplane
Frederick A. Giles	(Identity not stated)	Hess Bluebird Biplane
Charles W. Parkhurst	(Identity not stated)	Air King Biplane
Capt. Wm. P. Erwin	None	Swallow Monoplane
Lieut. Norman Goddard	Lieut. K. C. Hawkins	Own design

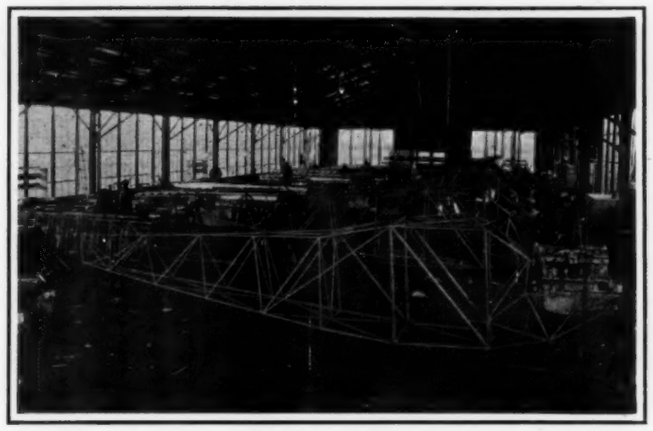
Fairchild Increases Manufacturing Facilities

A recent visit to the Fairchild factory at Farmingdale, L. I., showed a large expansion of the facilities over those which were available last winter. The old Sperry plant which formerly housed the construction of both the airplane and the Caminez engine has been taken over entirely by the Fairchild Caminez Engine Corp. This building is the one shown in the foreground of the photograph. A great deal of new machinery has been installed and the engine plant will soon be doing all its own machine work. The heat treating of the metal parts is being moved into a new building which is not shown in the picture.



Plant of the Fairchild Aviation Corp. at Farmingdale, L. I.

The Fairchild Airplane Manufacturing Corp. has been moved into the Truscon steel building shown just to the rear of the water tower. This building has an area of 24,000 sq. ft. while the various buildings combined have an area of 65,000 sq. ft. This main building contains the offices of the Fairchild Airplane Manufacturing Corp., the stock room and the fuselage and wing assembly departments. There is a separate building for the wood work milling machinery and one for doping and painting. The drafting and engineering department is also housed in a separate building. Moving into new and larger quarters is going on gradually in order not to produce too much confusion in the present production of planes. R. M. Kincaid, vice-president and general manager of the company stated that during August the company would be on a production basis of two planes a week. At present about 100 men are employed in the airplane division. The manufacture of the Fairchild pontoons is being done at Farmingdale but not in the main factory building.



Interior view of the Fairchild airplane factory

The expansion of the facilities at Farmingdale is another instance of the increasing scope of the various activities conducted under the direction of Sherman M. Fairchild. Mr. Fairchild first became known to those interested in aviation through his development of aerial cameras and air mapping. After several years of intensive work the Fairchild camera and map making organization won a foremost place in their respective fields. With the camera company going well Mr. Fairchild felt himself free to turn to the development of airplanes and engines. The airplane which is now in production is the result of the flying experience gained in photographic work and of the two years of perfecting the original model of the Fairchild monoplane. The Fairchild-Caminez engine which will be in production before autumn, has been under development for several years. The pontoons have also been under development for some time. The continued growth of the Farmingdale plant would indicate that Mr. Fairchild's ability and financial resources would bring about a success comparable to that of the camera company.

Belgium Selects De Murter and Quersin

The Belgium Aero Club has selected M. De Murter and M. Quersin to represent that country in the International Balloon race for the Gordon Bennett Cup, to be held at Detroit, Mich., this Fall.

De Murter has won the event five times, thrice in succession, thus giving Belgium permanent possession of the original cup. De Murter hopes to gain a second leg on the present cup for Belgium.

The National Air Races

News Notes and Some General Information

DETAILS OF the distribution of $15,000 worth of cash prize money to be awarded winners in the national air races to be held at the Spokane, Wash., airport, following the finish of the National Air race from New York to Spokane, and the Pacific Coast Air Derby race from San Francisco here, have been announced by Walter Evans, president of the National Air Derby Association of Spokane.

The list of national air derby awards also include several permanent trophies, which have been awarded annually at the national air races heretofore in Omaha, Detroit, New York, Philadelphia and Dayton. These trophies include the Aviation Town and Country Club trophy of Detroit to be awarded civilian fliers in the light commercial speed and efficiency contest, the Liberty Engine Builders' trophy for the military observation plane race and the Detroit News Air Transport trophy for the civilian air transport speed and efficiency race.

Walter Evans, president of the National Air Derby Association of Spokane, Wash.

Each of the 12 events in the national air races must have at least four, and not more than 40, entries. The events, and prizes offered, follow.

Free-for-all (civilian only) 800 cu. in. Prize money, $2500 divided $1000, first; $600 second; $400, third; $250, fourth; $150, fifth and $100 sixth.

National guard race (military). Prize money, $1000 divided $500, first; $300, second; $150, third and $50, fourth.

Light commercial speed and efficiency (civilian only). For the Aviation Town and Country Club of Detroit trophy. Prize money, $2500 divided $500, first; $250, second; $100, third. Efficiency $900, first; $500, second and $300, third.

Trophy race (civilian only) 510 cu. in. Prize money, $2000 divided $1000, first; $600, second and $400, third.

For observation places (military) 2-place planes for Liberty Engine Builders' trophy. Prizes—individual trophies to be awarded first, second, third and fourth winners.

Large capacity airplanes (military). Prizes—individual trophies to be awarded first, second, third and fourth winners.

For pursuit type planes, closed event for pilots and first pursuit group. Prizes—individual trophy awards for first, second, third and fourth winners.

Air transport speed and efficiency races (civilian) for the Detroit News Air Transport trophy. Prize money $2500. Speed, $1250, first; $750, second; $200, third. Efficiency, $1250, first; $750, second; $300, third and $200, fourth.

Free-for-all pursuit race (military). Prizes—individual trophies to be awarded first, second, third and fourth winners.

For light airplanes (civilians) 80 cu. in. displacement or less. Prize money, $1000 divided $500, first; $250, second; $150, third and $100, fourth.

Sport plane race (civilian) for engines of 300 cu. in. or less. Prize money $1000 divided $500, first; $250, second; $150, third and $100, fourth.

Novelty race for commercial planes (civilian). Prize money $1500 divided $750, first; $500, second; $150, third and $100, fourth. Entries limited to four teams of three planes each. Engines not to exceed 150 cu. in. displacement.

Major Fancher Flies Over Race Route

The $50,000 offered in cash prize money for the national air races, the National Air Derby race from New York to Spokane, and the Pacific Coast Air Derby from San Francisco here, has already attracted the attention of the nation's leading airplane manufacturers and pilots. Hundreds of inquiries are being received daily from all parts of the country since the National Aeronautic Association of the United States sanctioned the plans for the greatest aviation meet ever held in the West.

"People along the route of the National Air Derby declare the race from New York to Spokane will be the biggest thing ever done for the development of commercial aviation in the United States." Major Fancher, managing director of the National Air Derby association of Spokane, wired officers of the association upon his arrival in New York City.

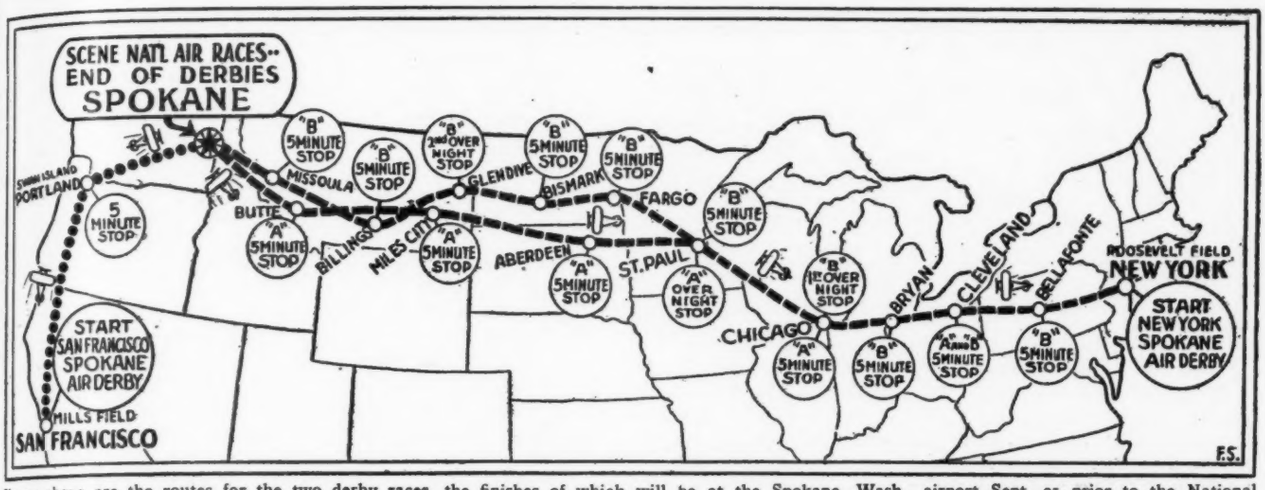
Maj. John T. Fancher, managing director of the National Air Derby Association of Spokane, Wash.

Major Fancher recently flew the route of the New York-Spokane race in a Douglas O2 plane. His flying time across the continent was 24 hr. 31 min.

"I find that the factory representatives are pleased with our rules and regulations, especially because we have two classes for different type of motors. They feel that we are really doing something constructive for their business, and the development of aviation in general. Heretofore, the big contest flights have been open to all makes of planes, both commercial and military, and the result has generally been that the fast government planes have always won.

"However, our two derby contests are for commercial stock models. The manufacturers state that this limitation is highly beneficial to them, and will mean a great deal to the development of their industry.

"I have never seen so much aviation enthusiasm as there is along the route of the big race. At every town where I stopped big committees were on hand to lend assistance. Butte, Mont., has offered $500 lap money for the first planes arriving in Butte. Missoula, Billing, Miles City, Glendive and Bismark have all offered free gasoline and oil to pilots flying in the race."



Shown above are the routes for the two derby races, the finishes of which will be at the Spokane, Wash., airport Sept. 21 prior to the National Air Races Sept. 23 and 24. Entries in both derbies have been divided into A and B class divisions in order to give airplane manufacturers of various horsepower engines a fair opportunity to test their product in competition with other engines of similar powers. Contestants in the B class of the Pacific Coast Air Derby will roar out from Mills Municipal Air Port, San Francisco at 5 A.M. Sept. 21 on their race up the Pacific Coast to Spokane. One hour later entrants in the A class division will take off over the same course. Starts in the A class division in the New York-Spokane flight will take off from Roosevelt Field, L. I., New York at 5 A.M. Sept. 20. Thirty minutes later contestants in the B class entry of this race will take-off for the West. From New York to Chicago the route of the National Air Derby will lead over the present route of the trans-continental air route. Both A and B class planes will fly the same route to St. Paul where, for the purpose of showing the number of aviation fields along the northern part of the United States the A and B classes have been divided as is shown in the above map. Over-night and five minute stops written into the rules and regulations in both classes are for the purpose of enthusing aviation supporters along the routes.

Nineteen Army Planes Officially Entered

Nineteen of the fastest and largest military airplanes in the service of the United States Army Air Corps have been officially entered in the national air races to be held Sept. 23 and 24.

Official entry of the government planes was announced in a letter to the National Air Derby Association of Spokane from Maj. W. G. Kilner, Air Corps executive, War Department, Washington, D. C.

Nine pursuit planes from the First Pursuit Group stationed at Selfridge Field, Mt. Clemens, Mich., will be flown across the northern portion of the United States to Spokane for participation in the races.

"For your information we are advising that the following planes of the army air corps will be entered in the various events of the National air races, which are to be held Sept. 23 and 24", Major Kilner stated in his letter. "When the personnel to fly these planes has been selected, their names will be furnished you."

The pursuit planes from Selfridge Field were recently sent into Canada, at the request of the Canadian government, to stage a flying demonstration.

Two airplanes of the O-I type, known as the Falcon observation planes, are included in the army entry. These planes have a speed of 125 m.p.h. Two planes of the C-2 transport type, equipped with Liberty engines, will also be flown in the races. This type is capable of making 90 m.p.h. Six planes of the P-I and PW-9 type have also been ordered to Spokane. These planes are powered with Curtiss and Packard engines.

Request Made for Military Cooperation

Commanding officers of all Army aviation forces in the United States have been requested by the National Air Derby Association of Spokane to issue orders allowing pilots in the regular army, reserve officers flying corps and national guard units to fly cross country to Spokane for the purpose of witnessing and participating in the national air races, Sept. 23 and 24.

The request for military cooperation in the national air races was sent to Major General Patrick, chief of air corps, Washington, D. C.; General Hines, commander of the Ninth corps area flying forces, San Francisco and Gen. Creed C. Hammond, chief of the militia bureau, Washington, D. C. General Hammond is a former resident of Portland, Ore.

"It is the policy of the war department to allow the pilots in all parts of the United States to witness the air races which will follow the finish of the National Air Derby race from New York to Spokane and the Pacific Coast Air Derby from San Francisco here," said President Walter Evans of the Air Derby Association.

"Therefore, we have entered our request with the commanding officer in order that the order may be issued in sufficient time to permit pilots in all parts of the country to fly here for the big aviation classics."

Buhl Airster is Airplane No. 1

Airplane No. 1 in the $18,500 class A division of the National Air Derby race from New York to Spokane, Sept. 19 to 21, will be a three passenger standard Airster cabin plane officially entered in the race recently by the Buhl Aircraft Co. of Marysville, Mich., and to be flown by Pilot Richard Hudson.

The entry of the Buhl Co. is the first official complete entry received by the National Air Derby Association of Spokane, sponsors of the New York-Spokane Derby, the Pacific Coast Derby from San Francisco here and the national air races.

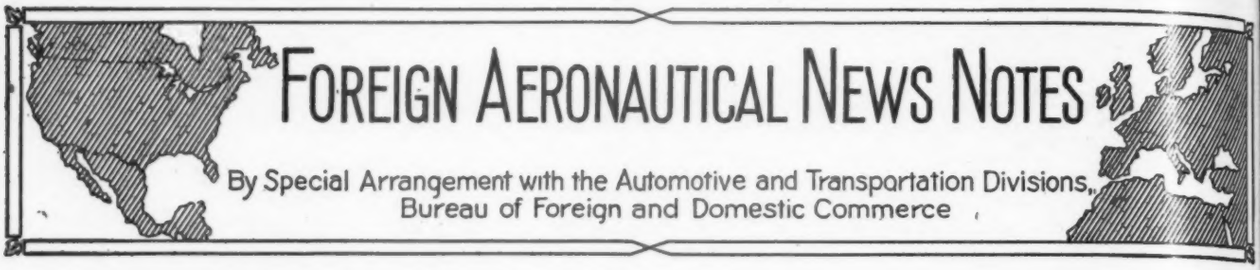
Herbert Hughes, vice president and general manager of the company signed the entry blank to which was attached a $50 check covering the entry fee. The Airster is powered with a Wright Whirlwind J-5CA engine, has a wing span of 252 ft., and was tested in flight the day the application of entry was filed.

The Spokane, Wash., Municipal Airport

Regarded by everyone who has landed on it as "one of the best fields in the United States", the Spokane, Wash., municipal airport is a mile and a half long and a half mile wide. A gravel surface and sub-soil provide perfect drainage, and the prevailing winds blow lengthwise of the field, which is the base for the 41st division air service unit, Washington National guard, and the northwest forest patrol planes. Floodlights on top of the three government hangars make night flying possible. The Spokane river forms the north boundary of the field. For scores of miles in all directions of the field are countless numbers of emergency landing fields.

Address Major Fancher

Rules, regulations, entry blanks and information may be obtained by addressing Maj. John T. Fancher, managing director, National Air Derby Association, 818 West Sprague Ave., Spokane, Wash.



FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions, Bureau of Foreign and Domestic Commerce

Association Technique Maritime Annual Meeting

The Association Technique Maritime et Aeronatique of France held its 31st annual meeting in Paris on May 31. Emmannuel Rosseau, President of the Association was in the chair. He was assisted by de Courville, Rey & Maurice, vice-presidents, and Mr. Bourges, general secretary.

Mr. Rousseau devoted his opening address to the progress made in shipping and aeronautics during the year.

The following communications were read and discussed:

Friction of steam in the pipes and connecting tubes, by Mr. Rey; Scientific methods employed in the Navy and Industry, by Mr. Lamouche; Use in the navigation of ultra-sounds, by Mr. Florisson; Development of Parson's steam turbine, by Mr. Dubertret; Cruising turbines on board battleships with geared turbines, by Mr. Aubert; Working-plankings in ship and aeronautical building, by Mr. Kahn; Use of the conjugated eddies in the aerodynamics of the circle and profiles, by Mr. Dupont; The underfeeding of the motor at low altitudes, by Mr. Lehr; Note about a process measure of the motor during flight, by Mr. Poincare; The problem of carburetion and the general specifications in reaching the characteristic high speeds in Diesel motors in which the fuel is injected mechanically, by Messrs. Lecheres and Weber; Making the ship stable, by Mr. Dacremont; Study on the circulation in the boiler, by Mr. Lorain; The use of high pressure steam on board light cruisers, by Mr. Thery; Note about towed targets, by Mr. Ficheur; Experimental study of the resistance to motion due to formation of eddies, by Mr. Barrillon.

The meeting ended on June 3 with a visit paid to the aeronautical Museum of Chalais Meudon and the test flying Center of the Technical and Industrial Service of the Aeronautical Department, at Villacoublay.

Australia Orders Flying Boats

The Supermarine Aviation Works, Ltd., of Southampton have just received an order from the Australian Royal Air Force for some of their Supermarine-Napier Southampton flying boats, each fitted with two Napier Lion engines, developing 1000 hp.

They are five seater reconnaissance boats, entirely self contained, in which, during long cruises, the crews live. Sleeping accommodation is provided by slinging hammocks in the hull and all cooking arrangements can be carried out on board so that they are independent of their base.

These aircraft will be the first twin-engined boats taken over by the Australian Air Service, and it is intended to subject them to a very strenuous test on arrival. They will be flown from Australia to Singapore where they will meet the flight of British Supermarine-Napier boats which are flying from England, in October next. The combined flight will then fly to Australia.

Examination for Associate Fellowship

Provided that a sufficient number of entries is received, the Royal Aeronautical Society's examination for candidates not otherwise qualified for Associate Fellowship will be held during the third week of September. Intending candidates should forward their entry forms as soon as possible. Full particulars of the examination can be obtained from the Secretary, J. Laurence Pritchard, 7 Albemarle St., Piccadilly, London, W. I.

The Royal Aeronautical Society offers annually a number of valuable prizes for papers. The R.38 Memorial Prize, of twenty-five guineas, is offered annually for the best paper received by the Society on some subject of a technical nature in the science of aeronautics, preference being given to papers which relate to airships. Entries must be received by Dec. 31, 1927, and the closing date for papers is March 31, 1928.

The Edward Busk Memorial Prize is offered annually for the best paper received by the Society on some subject of a technical nature in connection with airplanes (including seaplanes). Its value is twenty guineas. The closing date for entries is Sept. 30, 1927, and the closing date for the receipt of papers is Dec. 31, 1927.

The Silver Medal of the Society is awarded annually for the best paper published in the Journal of the Society in the year under review.

Travemunde to Have Airport

Travemunde, which is situated on the Baltic at the mouth of the River Trave, will be made a port for trans-Atlantic air travel, according to the plans of the federal government and the free states of Hamburg and Lubeck.

In discussing the advantages of Travemunde as an airport, those promoting the idea said that it will take land planes two hours to fly to Berlin, three-quarters of an hour to Hamburg, two to Bremen, and one and three-quarters hours to Copenhagen. Also within the same day passengers can reach Oslo, Stockholm, Riga, Warsaw and even Moscow.

Cairo-Basra Operates One Hundred Per Cent

Since its inception on Dec. 27, 1926, the Cairo-Baghdad-Basra Air Service has been operated at 100 per cent. regularity. This remarkable achievement over a route of 1,118 mi. is reflected in the air mail despatches, which now represent one-third of the total mail, and is still increasing every week.

Complete Around-Australia Flight

Capt. Kingsford Smith and C. P. Ulm have completed their flight round Australia in a Bristol biplane taking 11 days. The airmen followed, approximately, the route taken by Commander Goble who flew round the Continent in 1924 in 22 days, and when they set out it was with the idea of completing the journey if possible in eleven days.

The machine which was used by the airmen was a Bristol Tourer shipped to Australia some eight years ago by the Bristol Aeroplane Co., Ltd. Since that date the machine has been in constant service.

W. L. Hope Wins King's Cup Air Race

The 540 mi. air race for the King's Cup, flown recently in England was won by W. L. Hope in a de Havilland "Moth" with an average speed of 92.8 m.p.h.

The race for England's most highly prized air trophy was flown under most unfavorable weather conditions. Several types of planes were entered, and for the first time in the trophy's history, a woman competed; Lady Bailey, wife of Sir Abe Bailey, South African sportsman.

A new handicapping system caused strong protests at the start with the result that eight of the entrants withdrew. Hope's time allowance of 3 hr., 25 min. and 9 sec. was of great help to him, although he kept steadily ahead of his more powerful rivals all the way.

Side Slips

By ROBERT R. OSBORN

Commander Byrd's South Pole flight plans are already being featured in the papers, and the latest announcement is that a landing at the Pole will be attempted if conditions are favorable. The chief trouble with this Polar flying is, as we see it, that one has to take one's own pajamas along.

We trust Commander Byrd will be more successful on this flight in locating some "life or seals". After his North Pole flight the New York newspaper, which was interested in his expedition, announced in large headlines to its astounded readers "Byrd Sees No Life Or Seals." The newspaper reading public has been hoping for years that the first flight would find a seal; at least one seal; and when the explorers failed in that respect the sorrow of the man in the street was pitiful to behold. We are afraid that if the Commander doesn't do better this trip the crowd waiting to meet him in New York on his return will be reduced to 300,000.

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If there is anyone in the industry who can use the services of a young Norwegian pilot and navigator, will he please notify this column? We are not in a position to divulge his name, but can state that he has assisted in one polar flight and figured prominently in a trans-oceanic flight. He expects to take part in another polar flight which might take up three years, is being asked to attempt a globe encircling flight, is regularly employed as a test pilot for a large commercial ship building firm, and is being invited to join several other flights. Along about 1933 it appears that he might run out of work, so any inquiries for his services will be appreciated.

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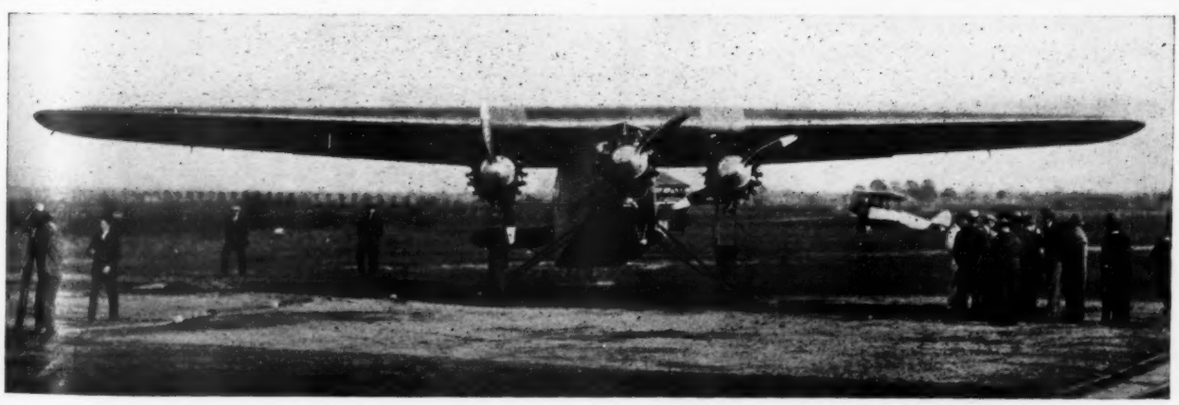
In the reports from Colonel Lindbergh's Good Will Tour, is the following item from Rochester, "Six women fainted and were taken under care by physicians, and one boy fell from the platform and sustained minor injuries while the aviator was speaking." We'd like to offer our sympathy to the Colonel for having to speak under those conditions, having done so once ourself. The boy who picked our open-air platform for his exercises fell not once, but six times in all. He selected the highest part of the guard rail and fell a different way each time, timing his dive to come just as we were attempting to emphasize a point. His swan dive was perfect but the jack-knife, back-flip, sitting-standing and sailor dives needed practice. We weren't quite as lucky as Colonel Lindbergh, however, as the boy who made a two-ring circus out of our speech didn't sustain even minor injuries.

Our vacation is set for some time in September, and we do hope that all of the long distance flights, which have been planned, will be accomplished by that time. We would like to have good weather during the vacation.

• • • •

This plan of having an airplane take off from the deck of an ocean liner as it approaches port, taking in mail and emergency passengers, appears to be a very good scheme. It should be a profitable enterprise also, as we can imagine the wealthier sea-sick passengers bidding rather high for the privilege of finishing the last two hundred miles of the trip in comfort.

The Intrepid Aviator was talking over this scheme the other day and commented that it would be his luck to get lost on the first trip and bring his passengers back over the 3400 miles they had just covered.



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AIRPORTS AND AIRWAYS

Boston, Mass.
By Daniel Rochford

With the visits of Lindbergh, Chamberlin, Byrd, Acosta, Balchen, Noville, Hegenberger and Maitland over and the Bay State National Guard air squadron on active duty at Mitchel Field until Aug. 13 air interest at the Hub is pointed now toward the second New England aviation show scheduled for Mechanics Hall, Boston, from Sept. 26 to Oct. 1. Running this year in connection with the annual New England radio exposition, the records for attendance which have run above a hundred thousand in past years are certain to be broken. The whole of the floor space in the exposition building will be filled with airplanes and the wall spaces with various accessories. Despite the air races in the far west, definite entries have been made from a half dozen factories and practically all commercial types of planes will be shown.

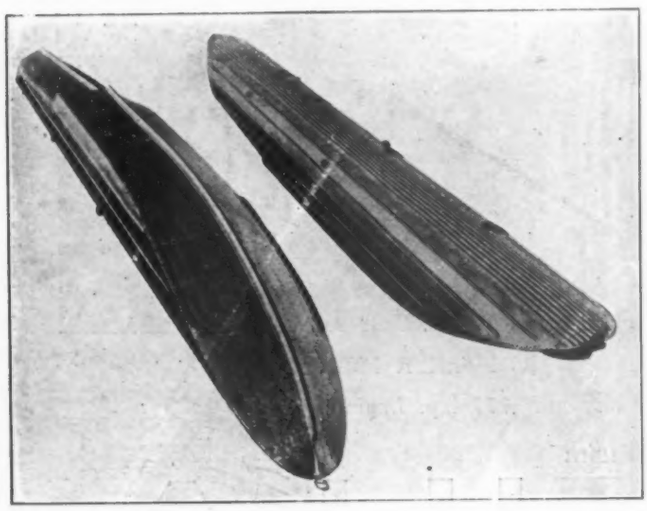
Local flying at the airport was checked the past week by fog and rain but, with a few good hours, on several days the different groups flew as follows: Commercial, 27 hr.; sport, 5 hr.; Army, regular and reserve pilots, 13 hr.; National Guard, 6 hr.; Naval reserve air station at Squantum, 62 hr.

The annual coast artillery camps along the coast out of Boston are in process and Lieut. Richard Cobb flew down to Mitchel and brought back a tow target ship to use in the gunnery programs.

Lieut. Frank C. Crowley, a Dorchester reserve pilot on active duty with the First Pursuit Group, flew the lead plane in a three-plane P-1 escort sent by the Army to Boston with Hegenberger and Maitland recently. On leaving the city the boys waved good-by by diving on the Common and pulling up over the State House. Governor Fuller was taken by surprise and rushed to the window to see what had fallen in the Common. Boston is unused to the roar of a pursuit plane whining down out of the sky.

It is stated that a prize of $25,000 and perhaps $50,000 will be raised by the citizens of Boston and awarded to the first plane to land at Boston Airport from Europe, England, Scotland, or Ireland. The idea for the prize originated with Sheldon Fairbanks, director of the Boston Radio-Aero Show, who offered the first thousand dollars of the money. Comdr. Richard E. Byrd was then interviewed by Mr. Fairbanks and the writer and agreed to act as trustee for the Boston fund. The matter was then put up to the Boston Chamber of Commerce who were to be asked to undertake the immediate raising of at least $25,000 and preferably $50,000. Mr. Fairbanks agreed to add another $5,000 personally if the fliers should land at Boston during the week of the air show, Sept. 26 to Oct. 1. The directors of the Chamber of Commerce held a special meeting in aid of the fund Tuesday afternoon, Aug. 9.

Air Service of New England, Inc., of Boston, has completed an aerial survey of the estate of Colonel E. H. R. Green at South Dartmouth to be used in connection with



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engineering for the private airport the colonel is building at Round Hills.

The tri-engined Fokker has been withdrawn from the Boston service and is for sale. Up to the present time Colonial has not accepted pay passengers in single engined planes but they are now going to fly passengers in single engine jobs. However, for the present at least, they will not accept them from Boston to Hadley but merely Boston to Hartford, due to early darkness on the evening run south. On the morning run north they will book through.

At the public hearings on Massachusetts airports at the State House recently 22 towns were represented and urged almost in every case that the State create a Department of Aviation; that towns be allowed to spend money on airports even outside their city limits and that taxes be abated or cancelled on airport land. The committee which held the hearings is to draft legislation for the General Court next Winter.

Milwaukee, Wis.

Milwaukee will be included on the new seaplane route between Chicago and Detroit, Paul Strasburg, president of the Strasburg Flying Service, operators of the line, announced recently. The service will not maintain a regular schedule this year, but will operate for business men and vacationists. Stops will be made here, upon call, for transportation to any city on the route, Mr. Strasburg said.

Maitland field, the new lake front airport, will soon be recognized as a full fledged airport. Daniel Kiser, an experienced airplane manufacturer, and Manfred Warshauer, president of the East Side Auto Sales Co., have formed the K. W. Aircraft corporation and will incorporate soon.

This concern has acquired a lease on North Western road property contiguous to the airport, and has let a contract for the erection of a hangar 52x80 ft., a service shop, and a gasoline station. A recommendation will be made to the harbor commission at its next meeting that Mr. Kiser be appointed custodian of the airport.

Mr. Kiser moved his airplane manufacturing plant to Air City, at Sturtevant, Racine county, some months ago from New Butler, Wis. He expects to leave some of his planes in storage there for a time at least, while he develops the new commercial venture here, and may keep a man at work in the Air City plant.

Fred C. Borcherdt, Jr., exposition business manager of the Wisconsin State fair, offered the fair grounds to Philip Koehring, president of the Milwaukee Association of Commerce, for the reception of Col. Charles A. Lindbergh, when he visits this city Aug. 20 and 21.

This offer, together with various other plans for the city's reception, was discussed at a meeting of the air service committee of the Association of Commerce this week.

With fifty airplanes circling overhead, the Lake Geneva air and water regatta, hailed as the largest and most spectacular event of its kind ever held in the middle west, got under way Thursday, July 28, with a formal opening ceremony conducted by Maj. Gen. William Lassiter, commander of the Sixth corps aera of the United States Army.

Addresses were made during the day by Governor Zimmerman, Eddie Rickenbacker, famous World War ace; William P. MacCracken, assistant secretary of commerce for aeronautics; Col. Paul Henderson, known as the father of the air mail service; Thomas Hamilton, Milwaukee airplane manufacturer; Major Thomas Lamphier, commandant at Selfridge Field; Major Howard Greene, Milwaukee, official of the Wisconsin State Historical Society, and A. H. G. Fokker, airplane manufacturer. Airplane races were held throughout the regatta.

The program of July 29 consisted of an aviation institute meeting at the Y. M. C. A. auditorium where Maj. R. W. Schroeder, former altitude title holder discussed altitudes. At noon there was a luncheon for the pilots at the Hotel Geneva.

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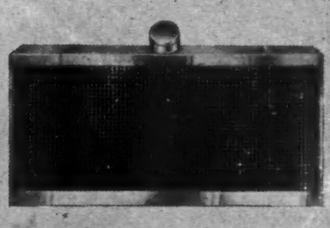

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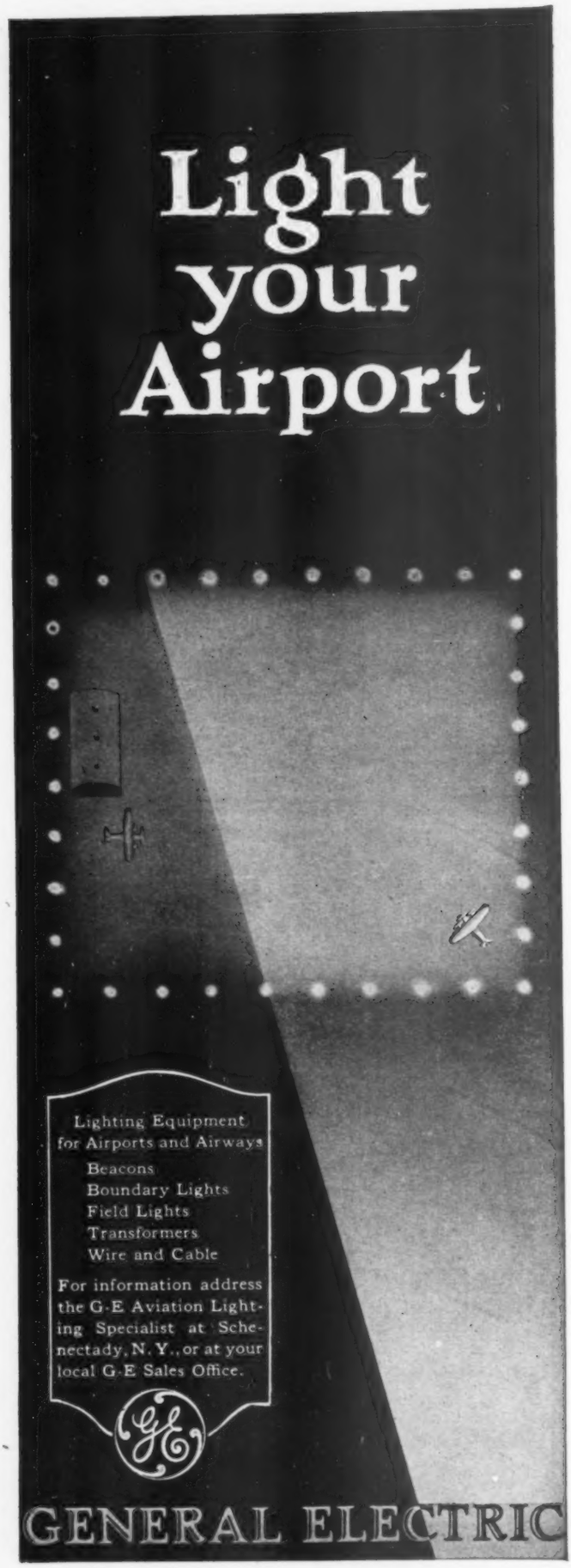
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In the afternoon there was an airplane race for 90 hp. craft over a course circling Lake Geneva for the Hamilton cup. In the evening an elaborate fireworks display on the lake and an illuminated aircraft exhibition over the city were featured. Later in the evening the American Legion smoker for pilots was held aboard a lake steamer and at a reception to the visiting ladies at the Hotel Geneva, Mrs. Thomas G. Hamilton spoke on "Women in Aviation".

On Saturday morning, July 30, the Aero Institute met at the Y. M. C. A. auditorium, with a discussion on technical subjects led by Richard Peck, pilot of the West Guinea expedition. In the afternoon there were demonstrations and exhibitions of aircraft, sky-writing and other novelties, besides target competition between United States Army planes. The evening entertainment featured a Venetian parade of watercraft directed by Leo Lankie.

Sunday morning, July 31, was marked by exhibition flying of visiting pilots and the final address on aviation was given in the afternoon by Lieut. Loren H. Littlefield.

Syracuse, N. Y.

By John S. Pendergast

The recent visit here of Col. Charles A. Lindbergh added impetus to the work of developing the Syracuse Municipal airport. Plans have been completed for erection of a beacon and boundary lights at the field to accommodate night fliers and the air mail.

Syracuse will be a stop on the Albany to Cleveland airmail route. Planes are expected to be in operation on this route within 60 days, the contract having been let two weeks ago to the Colonial Airways, Inc.

Colonel Lindbergh on the occasion of his visit here was given the greatest welcome ever tendered an individual in this city. Five thousand persons saw him land the Spirit of St. Louis at the municipal field and 30,000 saw him in Archbold stadium at Syracuse university, where he delivered his afternoon address. Many more thousands lined the parade route from the airport to the stadium.

Gordon K. Hood, manager of the Syracuse airport, was the first to greet the colonel when he landed. Other Syracuse pilots, including Dr. H. E. Luther, Ernie B. Hannam, and George Freeman were on hand to greet Colonel Lindbergh. The first words the colonel spoke were of praise for the municipal airport and its manager.

Lieut. Charles H. Cantwell of Mitchel Field landed at the field recently and was equally warm in his praises. He was returning from Buffalo where he organized a ground crew to handle the army airship RS-1.

Members of Syracuse Chapter, National Aeronautic association, volunteered to give their spare time to aid city forces in continuing the work of improving the airport at their last meeting. Mr. Hood presided.

Springfield, Mass.

By Charles Hanson Gale

Harry Herman, of the Springfield Airlines, flew two passengers to New York for the Dempsey-Sharkey fight. He made the hop in a Swallow in 80 min. each way. The passenger who chartered the plane for the flight paid for his trip by a bet.

Elmer Dempsey has been engaged by the Massachusetts Airways of this city. He will ferry the first Eaglerock purchased by the company from the Denver factory to Springfield soon. Another Eaglerock is expected to be delivered about the same time. The local company, the second formed this Summer, will start operations as soon as these planes are on the field at Agawam.

Prospects of a municipal airport are increasing with strong indications of interest on the part of the city government. The suggestion that the airport take the form of a war memorial has met with considerable favor.

An air pageant of large proportions has been promised for Springfield on Sept. 3, 4, and 5. A local organization is perfecting plans for what they hope will be the most spectacular display of flying ever seen here. Army and Navy

fliers are included among the talent expected and efforts have been made to secure the appearance of several of the trans-Atlantic aviators.

The first air beacon to be placed in this city will be erected on the roof of the Forbes & Wallace department store in the down town section. This will be a 24-in. revolving General Electric beacon mounted on a 60 ft. steel tower.

Among the 18 students now under the tutelage of Pilot Harry Hermann of the Springfield Airline, Inc., is a former pilot in the Italian air force who is trying to get back into the game after a long absence that started soon after the close of the World War. He began his flying career in 1909 in Italy and served through the Turco-Italian and the World Wars.

Springfield Airlines, Inc., continues to do a thriving passenger and student business at Dunn Field. The two new Swallows recently received have both been sold. Visitors to the field have been coming in such large numbers that the railroad has had to place an automatic signal at a crossing which for years has been used only by occasional hay wagons and campers along the river. The volume of business has made it necessary for the company to consider securing an additional pilot.

Boise Field, Idaho

By Robert Edward Blackstone

At a luncheon of the Idaho Airways Association, held here recently, the advisability of organizing a chapter of the National Aeronautical Association, was discussed. It was decided that at an official meeting to be called within the next two weeks, plans would be formulated with that end in view.

It was indicated that the Idaho Airways Association would endeavor to retain its present name but would come under the supervision of the national organization.

Business interests of Nampa, Idaho, which is 20 mi. from Boise airport, are insisting that Nampans establish a landing field, claiming that in five years a city without one will simply be "off the map." On the advice of air-traffic experts, no land will be considered unless it is at least one mile square.

Paul A. Andert, Varney mail plane pilot on the Salt Lake-Boise hop, began his vacation recently. With his wife and two children he took a motor trip to San Diego, where he formerly lived and was a member of the Army Air Corps Reserve.

Frank P. Bell, traffic manager for Varney Air Mail Service, who is stationed in Seattle, was a Boise visitor over the week-end and on July 25 resumed his journey to Burley, Idaho, where he is to make a survey for a possible mail stop, which will serve all Southern Idaho.

The new fast plane, a Floyd Stearman, special job, that the Varney Airmail Service contracted for a few weeks ago, was landed at the Boise airport last week. Mr. Cuddeback, chief pilot for Varney, piloted the plane from Salt Lake. Fred Hoyt, pilot for Stearman Aircraft, Inc., flew the machine from San Francisco to Salt Lake.

The new plane "clocked" at the Stearman factory did 137 m.p.h. wide open.

The journey from Salt Lake, 320 mi., to the Boise airport, took 2 hr., 55 min., using 28 gal. of gasoline.

Dansville. N. Y.

The formal dedication of Dansville Airport will take place on Aug. 19. The field consists of 62 acres of clear, level land and is bounded on the west by the Dansville and Mount Morris Railroad. It is located on a direct airline from Erie, Pa., to New York City, and from Washington and Baltimore to Toronto. Preparations are under way to mark the field with a 100-ft. circle. The name Dansville Airport will be placed in letters fifteen feet high at the north and south sides.

There are several large industries here whose products can be transported by airplane. Lynn Pickard is a member of the local airport committee.

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Wyo., Mont. & W. Neb.—Wyoming Airways, Inc., Casper, Wyoming
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W. Kan. and E. Neb.—C. E. Steele, Dodge City, Kansas
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Utah, Nevada, S. Idaho—Rocky Mountain Airways, Salt Lake City
Mississippi—Tri-States Airways, Bry Block, Memphis, Tenn.

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Winston-Salem, N. C.

This city has completed plans for one of the greatest airports in the South, and grading has already started on the site selected. It is hoped to have much of the work completed by Oct. 14, the day that Colonel Lindbergh will arrive in Winston-Salem.

Four-way runways will be graded, which will permit landings from any direction. The runways will be 450 ft. by 1,600 ft. The port will be lighted and equipped with standard markers, wind indicators, hangars and later with machine shops. Gasoline and oil stations will also be provided.

The site is thought to be excellent because of its proximity to the city. The soil is generally firm. The tract will comprise about 100 acres. Hangars for private planes will probably be erected and ample parking space for automobiles will also be provided. A charter has been granted, under the name of the Miller Municipal Airport, Inc.

Rochester, N. Y.

By Joseph F. Farren

Colonel Charles A. Lindbergh visited Rochester on the morning of July 29 and caused a furor in aeronautical circles. The following day, July 30, the RS-1, the army's latest blimp, afforded the residents a beautiful sight as it gracefully floated over the city a little before midnight. The two visits brought the city officials into a sudden conference and a definite announcement was made that the city airport will be equipped with hangar, runways, gasoline and oil station and tool sheds within the next sixty days.

Commissioner Harold W. Baker, in charge of the airport, piloted by Bill Dunlop, returned recently from a flying inspection tour of airports. Commissioner Baker found the Hadley Field, Brunswick, N. J., a model airport and will follow the same plan in developing the Rochester Airport.

Members of the Rochester Flying Club have been rather busy the last few weeks giving radio talks twice a week and talks before various clubs in Rochester and surrounding towns every week. The early history as well as the present activities is being given to create a better understanding of aviation.

The latest addition to the aviation circles here is James Ryan who has been carrying passengers on the city field for the last few days in his new Waco-9.

Neenah, Wis.

Four airplanes of the single-seat Thomas Morse Scout type arrived at Neenah recently for the Wisconsin Airways, Inc., the new corporate name of the Larson brothers fliers. The planes were acquired by the company at Houston, Tex., and they intend to recondition them and then market them. The planes will not be used in the company's regular passenger service, as it is the policy of the company to use only new planes in their flights.

The Wisconsin Airways company has been conducting an extensive passenger carrying service since early Spring. Its planes have made almost daily trips, flying mostly to the north.

La Crosse, Wis.

La Crosse has formed a commercial aviation company with Lieut. H. W. Sheridan at its head. The company has purchased a Buhl Airster with an OX5 engine, and is known as the Blackhawk Skyways. Lieutenant Sheridan plans to launch his flying school immediately, having several prospects already in view. Student instruction will be the principal enterprise of the corporation aside from pleasure riding which has been in demand here.

Madison, Wis.

The local Association of Commerce is striving through its publication to awaken the people of Madison to the necessity of owning a municipal airport. The bulletin points out that unless Madison soon acquires a municipal field, it will not get air mail services, and it urges the city to purchase what is now a private airplane field for that purpose.

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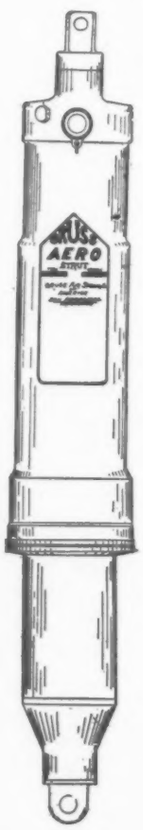

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Cheyenne, Wyoming

By Geo. R. Iland, Jr.

The Cheyenne Airport was the scene of considerable aviation activity during the week of the Frontier Days celebration which has become a national event. Among those represented were the Mountain Fliers of Denver. These boys enjoyed a profitable week.

The Wyoming Airways of Casper enjoyed the most profitable week of those operating here. They sold one of their planes to an amateur pilot of Laramie. All three companies operated the same type of plane, the Hisso-Standard.

J. Don Alexander and son Don Jr., of the Alexander Aircraft Co., of Denver, flew up from Denver bearing a message from Governor Adams of Colorado to Governor Emerson of Wyoming. They circled Frontier Park, dropping the message, and later landed at the local airport returning to the show by auto. They were using the Whirlwind Eaglerock recently flown in the Ford Tour.

The Colorado National Guard Air Squadron was represented here July 28 by Lieuts. C. L. Reavis, V. G. Stone, Dan Kearns, and Sergt. Clyde Plank. They flew up from Denver in three of the PT-1s with which the Colorado Guard is equipped. In the afternoon they did a little exhibition flying before returning home.

Lieut. J. J. Williams, of the 17th Pursuit Squadron, was an overnight visitor at the local airport recently. He was flying a Curtiss Hawk from Detroit to Salt Lake City.

UNITED STATES AIR FORCES

Americus Intermediate Depot Leased

The Americus Air Intermediate Depot, Americus, Sumter County, Ga., containing approximately 411 acres and improvements, has been leased for one year to a New York company, who will use it for the storage of cotton. The Americus Air Intermediate Depot has been twice advertised for sale but proposals received were less than the appraised value. Before acquisition by the Government, for use during the War, it was a part of the Arles Plantation.

Air Corps to Do Extensive Mapping

Two aerial survey detachments, each composed of a commissioned officer of the Army Air Corps who is a photographic pilot, and an enlisted photographer, were recently authorized by the War Department for the purpose of assisting the U. S. Geological Survey in carrying out its extensive program for the present calendar year in mapping areas in various states throughout the country.

One of these detachments will photograph areas in Maine, New Hampshire and Vermont, approximately 8,000 sq. mi. A great portion of these areas, particularly, in Maine, have never been adequately mapped, and all existing maps are old and somewhat obsolete. The other detachment will begin operations on a 4,000 sq. mi. area in Illinois, and later will photograph areas in Michigan and Wisconsin.

One detachment of this kind, organized last year for a like purpose, photographed during a period of six months approximately 9,000 sq. mi. of territory in the States of Michigan, Wisconsin and Illinois. Through the work of this detachment it is estimated that the saving to the Government was approximately $100,000, thus demonstrating the efficacy and economy of aerial surveying.

Each aerial survey detachment is equipped with a tri-lens camera and accessories, and furnished with two special photographic planes, one of which is held in reserve. The function of these detachments is to make aerial photographs which are in turn used in making topographic maps by the Geological Survey. The personnel of the detachments is relieved of all military duties and assigned exclusively to aerial sur-

The Aeroplane

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CHARLES GREY
Editor

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vey activities for a period of six months. It is placed under the direct control of the Chief of Air Corps, who is authorized to issue the necessary orders for its movement and employment, according to the program submitted by the Geological Survey.

Air Corps School for Instructors

The Army Air Corps, in its endeavor to establish uniform methods in the training of flying students, has established a school for instructors at the Air Corps training center at Duncan,Field, San Antonio, Tex. All officers now on duty as instructors at the Primary Flying School at Brooks Field, Tex., and the Advanced Flying School at Kelly Field, Tex., are required to take the course at this school, in addition to other pilots recently assigned to duty as instructors at the Primary Flying School at March Field, Riverside, Cal.

The Air Corps is desirous of eliminating individual methods and instituting a standard method of instructing a student in each particular maneuver of an airplane in flight. Under such a system a student is less apt to become confused when he is transferred from one instructor to another. Furthermore, the Instructors' School will serve as a means of coordinating the Advanced Flying Course with that of the Primary Schools.

Three classes were instituted at the Instructors' School, beginning June 1, each one a month in duration. Two classes have been graduated and the last class will graduate Sept. 1. About 50 pilots have been assigned to each class. Specially qualified pilots from Brooks and Kelly Fields were detailed as instructors at this school.

Academy Students Fly 30,302 Miles

The first group of 262 student officers of the Naval Academy graduating class has flown 30,302 mi. this Summer. The other half of the class is now engaged in flying training. Each student has seven and one-half hours of training, with flights averaging about two hours.

Argentine Pilot With Army Air Corps

At the request of the Argentine Embassy, the War Department has authorized the attachment of Lieut. Edgardo Bonnet, Argentine Navy, to the First Pursuit Group, Army Air Corps, at Selfridge Field, Mich., from Aug. 23 to 27, and for his admission to the Air Corps Tactical School at Langley Field, Va., in September. Lieutenant Bonnet is at present on duty with the 12th Observation Squadron, Fort Sam Houston, San Antonio, Tex. He is a qualified pilot of the Argentine Navy.

Aviation Medical School in New Quarters

The Army School of Aviation Medicine, until recently housed in a large steel airship hangar at Brooks Field, San Antonio, Tex., has just moved into the new building designed and constructed for its use. The School of Aviation Medicine, an outgrowth of the World War and until last year located at Mtchel Field, Long Island, was removed to Brooks Field in the interest of greater efficiency. By bringing its students into daily contact with those undergoing flying training it was believed the former would be better able to learn the various physical problems confronting the latter and make a more thorough study of the flier's inherent flying ability or lack thereof.

During the fiscal year just ended 20 medical officers, nine from the Regular Army, nine from the Reserve Corps, and two from the Navy, graduated as flight surgeons from the School. Eight Reserve officers and two National Guard officers graduated as physical examiners for the Air Corps, and are accordingly qualified to conduct the physical examinations for fliers, commonly known as "64 examination".

The course for flight surgeons at the School of Aviation Medicine requires three months of intensive instruction in all matters pertaining to a flier's physical and mental fitness for going into the air. The school is organized into the following academic departments: Administration, neuro-psychiatry,

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aviation physiology, opthelmology, otology, psychology and cardiology. In addition to the strictly air medical problem, students of the school are given an advanced course on the eye, ear, heart, nervous and mental diseases, in order that they may be able to conduct the highly technical examination required for fliers. An endeavor is also made to instill in the student a true appreciation of the stress undergone by the fliers at all times, the symtoms brought on by flying at high altitudes, and the physical and mental exhaustion incident to prolonged flights. They are taught to recognize the manifestations of flying "staleness" which is a most insidious and dangerous ailment and which may exist unknown to aviators.

The flight surgeon bears the same relation to aviation as does the specialist in preventative medicine to mankind, in that the two are concerned with the prevention of disability and the maintenance of physical efficiency. After completion of their course and upon being assigned to flying fields for duty, flight surgeons are encouraged to take flying instructions and to qualify as airplane pilots. There are 51 flight surgeons at the various Air Corps fields, all but one of whom are on a flying status. Seven of them are qualified as airplane pilots. At present there are 20 regular Army flight surgeons who are not on duty with the Air Corps, as well as five examiners. In the medical Reserve Corps there are 34 flight surgeons and 33 examiners, now on an inactive status. Assigned to the National Guard Air Corps organization are four flight surgeons and nine examiners.

The studies pursued at the school in aviation medicine, this new branch of medical science, have proved of great importance to aviation and have resulted in the recognition of the United States as one of the leaders in a line of work which has meant the saving of many lives.

Cavalry-Air Corps Maneuvers Close

On Monday, July 25, the first day of the Cavalry-Air Corps Maneuvers, held in the vicinity of Fort Bliss, Tex., and involving 42 planes piloted by the members of the August graduating class of the Advanced Flying School, Kelly Field, Tex., and the First Cavalry division, demonstrated many phases of air fighting. Bombing and machine gun attacks were made with live bombs and ball amunition against columns of ground targets. Another phase of the exercises was the attack of attack planes by pursuit planes. Later on in the day observation planes were given practice in the adjustment of artillery fire. The day's maneuvers were closed with a simulated attack of the First Cavalry Division on the march by a squadron of attack planes.

Tuesday's maneuvers were devoted to tactical problems involving two separate groups of combined arms. Inter-communication and coordination between ground and air forces were given great emphasis.

The exercises were brought to a close on July 27, with a two-sided maneuver in which all air and ground forces operated in the attack and defense of Fort Bliss.

Navy Air Orders

Lieut. Delbert L. Conley det. Nav. Air Sta., San Diego, to c.f.o., USS Lexington.

Lieut. George T. Cuddihy det. Nav. Air Sta., Anacostia, to VF Squad. 3 S. Aircraft Squad., Sctg. Fleet.

Lieut. Frederick B. Kauffman det. Nav. Air Sta, Pensacola, to VT Squad. 2B. Aircf. Squad., Battle Fleet.

Lieut. Malcolm F. Schoeffel det Bu. Aero. to connection organization of VT Squad. 4B (USS Langley). Orders June 16 revoked.

PROPOSALS FOR PRIMARY TRAINING AIRPLANES

Office of the Contracting Officer, Wright Field, Dayton, Ohio. Sealed proposals will be received here until 10:30 A.M., November 28, 1927, Eastern Standard Time, for the development of a Primary Training Airplane and furnishing proposed airplane in quantities of one, two, five, ten, twenty-five, fifty or one hundred at Government's option. Further information upon application. Adv.

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Lieut. William J. Slattery det. Nav. Air Sta., Pensacola, to VT Squad. 2B, Aircraft Squad., Battle Fleet.

Lieut. Paul B. Thompson, Jr., det. Nav. Air Sta., Pensacola, to VT Squad. 2B, Aircraft Squad., Battle Fleet.

Lieut. Guy D. Townsend det. Nav. Aircraft Fact., Navy Yard, Phila., to connection organization VT Squad. 3S, Aircf. Squad., Sctg., orders May 6 revoked.

Comdr. Ernest D. McWhorter det. Nav. Air Sta., Nav. Oper. Base, Hampton Roads, to temp. duty Nav. Air Sta,, Pensacola.

Lieut. Frederick W. McMahon det Nav. Air Sta., Pensacola, to Nav. Air Sta., Pensacola as aide to Rear Adm. Frank B. Upham.

Lieut. Burton G. Lake det. com. USS O-7, to asst. insptr. of Nav. Mat'l. Pratt & Whitney Aircraft Corp., Hartford.

Lieut. (jg) James E. Baker det. VS Sqd. 2-B, Aircf. Squad., Battle Fleet, to VO Squad. 2-B, Aircraft Squad., Battle Fleet.

Lieut. George P. Seifert det. Nav. Aircraft Fact., Navy Yard, Philadelphia, to Aircf. Squad., Battle Fleet.

Army Air Orders

Sec. Lieut. Wofford Eugene Lewis, Air Corps Res., Kansas City, to active duty Marshall Field, reverting to inactive status Aug. 27.

Major Albert L. Sneed, Air Corps, Kelly Field, to San Diego, Cal.
First Lieut. Harold L. Clark, Air Corps, Fairfield, to Kelly Field.
Capt. Frank W. Wright, Air Corps, to additional duty at Bolling Field.

The following officers of the Air Corps Res. are ordered to active duty from and to places indicated and will revert to inactive duty Aug. 20: Sec. Lieut. William Pearce Williams, Los Angeles, to Clover Field, Santa Monica; Capt. David Morton Warner, Dayton, to Rantoul, Ill.; First Lieut. Michael Rubner, Chicago, to Rantoul; Sec. Lieut. Guy Eastman Lawrence, Dayton, to Rantoul; Sec. Lieut. Frank Pratt Haydon, Saginaw, to Fairfield; Sec. Lieut. Benjamin Harrison Rich, Dayton, to Fairfield; Major Clifford Burnham Griswold, East Orange, to Mitchel Field; Capt. Arthur Wilson, Rochester, N. Y., to Mitchel Field; Sec. Lieut. Lionel Rosario Cartier, O'Fallon, Ill., to Wright Field; Sec. Lieut. Ronald McKean Hazen, Minneapolis, to Wright Field; Sec. Lieut. Jerome Carlock Annis, San Antonio, to air intermediate depot, that city; Major Phillip Page Cook, Paris, Tex., to San Antonio; Sec. Lieut. Donald William Du Vall, Denver, to San Antonio; Capt. Frank Anthony Cerruti, Sec. Lieuts. Fowler Wesley Barker and Frederick Leon Gayton, all of Detroit, to Air Corps procurement planning representative, that city; Capt. Earl Hamilton McCollister, San Mateo, to Rockwell Field; Sec. Lieut. Edward Hastings Bowman, Toledo to Wright Field.

First Lieut. James Emory Scheirer, Air Corps Res., Atlanta, to active duty Fairfield, Ohio, reverting to inactive status Aug. 27.

Major Gerald C. Brant, Air Corps, Washington, to Crissy Field. . .

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AIRCRAFT PATENTS

Copies of patents may be obtained by writing the Patent Office, Washington, D. C., giving the patent number and the name of the inventor. Cost 10c each.

Patent No. 1,631,895—GAS CELL OF RIGID AIRSHIPS. Karl Siller, Friedrichshafen, Ger., assignor to Luftschiffbau Zeppelin Gesellschaft mit beschrankter Haftung, Friedrichshafen, Ger. 5 Claims. A combination gas cell for rigid airships comprising inner walls confining an inner space; and outer walls; said outer walls together with said inner walls confining an outer jacket space; said inner walls and said outer walls being connected to each other: said inner walls being so large that upon decrease of pressure in said jacket space they may cover substantially the upper half of said outer walls.

Patent No. 1,631,908—RIGID AIRSHIP. Karl Arnstein, Friedrichshafen, Germany, assignor to Luftschiffbau Zeppelin Gesellschaft mit beschrankter Haftung, Friedrichshafen, Bodensee, Ger. 8 Claims. A rigid airship comprising a longitudinal member and a cross member, said cross member comprising a plurality of girders, part of said girders being so arranged in one common plane substantially at right angles to the longitudinal axis of said airship as to form a substantially polygonal truss with rigid circumferential members.

Patent No. 1,631,766—PARACHUTE. James M. Russell, San Diego, Calif., assignor to Herbert R. McClintock, San Diego, Calif. 16 Claims. A parachute having an upper supporting surface and an outer continuation for said surface extending downwardly and inwardly therefrom, and means to directly interconnect the upper and lower portions of said continuation.

Patent No. 1,619,372—WING CONSTRUCTION FOR METAL AIRPLANES. Adolf Rohrbach, Charlottenburg, Germany. 34 Claims. In a metal wing structure for airplanes an intermediate section forming the backbone of the wing and including a pair of spaced and laterally braced longitudinal spars which form the front and rear boundary edges thereof, a pair of upper and lower imperforate stressed skin cover plate units firmly secured to and bridging said spars, and one of said cover plate units including a plurality of transverse former and girder members firmly secured to the inner side thereof at intervals throughout their length to form a rigid part thereof and said transverse girder members having end connections for attachment to the laterally braced spar unit whereby the final assembly of the intermediate section may be effected by superimposing the transverse girder and cover unit upon the spar unit.

Patent No. 1,631,767—PARACHUTE PACK, James M. Russell, San Diego, Calif., assignor to Herbert R. McClintock, San Diego, Calif. 15 Claims. In a parachute pack adapted to be worn by an aviator, a container for the parachute made of flexible material and having a face piece and a plurality of said flaps connected to the edges of the face piece, a parachute within the container, a separate triangular piece of material on the opposite side of the pack from the face piece, and locking cones releasably holding the corners of said separate pieces to the side flaps and to the face piece and extending through the pack to retain the parachute enclosed in position between the face piece, side flaps and the separate piece.

Patent No. 1,619,183—PROCESS OF PRODUCING SMOKE CLOUDS FROM MOVING AIRCRAFT. Donald B. Bradner and Nicholas E. Oglesby, Edgewood, Md. 8 Claims. In a process of producing a smoke screen, ejecting from a moving body a liquid which reacts with a constituent of the air to produce a smoke said body moving at a velocity sufficient to produce a highly dispersive action upon a liquid falling therefrom and said smoke-producing liquid being ejected in a direction substantially opposite to that of the moving body and at a velocity to counteract said dispersive action.

Patent No. 1,631,768—PARACHUTE HARNESS. James M. Russell, San Diego, Calif., assignor to Herbert R. McClintock, San Diego, Calif. 12 Claims. In a parachute harness, in combination, suspension straps extending down in front of the aviator's seat in the form of a sling, a front strap extending down from one suspension strap at the front of one shoulder, crossing the chest to a point at the opposite side of the body and then returning at the front and engaging with said one suspension strap again and continuing on around back of the body for engagement with the other suspension strap.

Patent No. 1,627,968—TORPEDO-LAUNCHING MEANS FOR AIRPLANES. Fritz W. Hammer, Lichterfelde, near Berlin, Ger., assignor to F. W. Hammer Corp., New York. 1 Claim. The method of launching a torpedo from an advancing airplane which consists in discharging the same tail first in an inclined upward and rearward direction from beneath the airplane.

Patent No. 1,619,373—WING FOR FLYING MACHINES. Adolf Rohrbach. Charlottenburg, Germany. 9 Claims. A metal wing for flying machines consisting of an internal skeleton frame structure formed of interconnected transverse frame members and continuous uninterrupted longitudinal girders, said longitudinal girders and transverse members having co-planar bearing and supporting surfaces and a flat outer metallic skin lying flat against said girders and transverse frame members, said outer skin being divided longitudinally of the wing into sections which are flat throughout their entire areas which are rigidly and directly secured to both the girders and the transverse frame members with each pair of adjacent sections overlapping each other along a transverse frame member in the plane of the outer skin and firmly secured to each other and to the transverse member along the coplanar overlapping part.

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PUBLISHER'S NEWS LETTER

The public has not as yet awakened to the effect long over ocean flying will have on man's idea of the surface of the globe on which we live. In spite of the fact that everyone is taught that the earth is round and few now doubt it, the system of map making now in use has created an impression which to the average mind makes the earth's surface the form of a cylinder. The cost of globe maps has largely been responsible for this distorted point of view. Since the time of Mercator, efforts have been made to show the surface of a sphere on a flat surface and this distortion has created many ideas that give a very false idea of distances and directions.

* * * *

Take a few simple illustrations which may startle many. Suppose a prize were offered by a New Orleans sportsman for a flight to Calcutta, India. Probably only one person in a million would know that the way not to go would be via Spain and the Suez Canal. All the others in the million would probably be surprised to find that the shortest route would be a circle course through New York, Quebec, North Labrador, through Central Greenland, north of Iceland, Sweden and Norway, through the Steppes of Russia, Tibet and over the Himalayas. Take even a better known route. Suppose a person standing at Times Square, New York, were asked to point toward Japan. The cylindrical idea of the earth gained from maps would cause almost everyone to point due West along Forty-second Street, whereas those who gain their geographical knowledge from globe maps would point toward Buffalo on a line that would cross Lake Ontario, Hudson Bay, Point Barrow, Alaska, Siberia and the Sea of Okhotsk.

* * * *

A flight from Washington to Moscow taking the shortest route would pass over New York, Massachusetts, New Brunswick, Maine, through the middle of Iceland, across Central Norway, ending at the Soviet Capital.

The New York to Rome Flight will pass over New Foundland and cross France. Many other equally surprising routes could be selected, but those mentioned above will serve to demonstrate the incorrect idea of direction the maps we use create and perhaps show why every school in the United States should give its instruction in geography from a globe map rather than from book plates.

* * * *

An ideal map of a country should give the true shape, true relative size, the correct distances between two places, true directions, as well as the true latitude and longitude. But as it is impossible to do this, compromises have to be made and the result has been that while maps of continents have been sufficiently accurate for general use, they have given wrong conceptions of the relative locations. Trade routes, too, have served to give false impressions. For climatic reasons these routes have ignored in many instances the shortest distances. They have also been laid so as to touch trade centers. All of which will have to be changed for the aerial age which is now dawning.

* * * *

As the next generation will be vitally concerned with air transport it is time to commence a campaign for the more general use of globe maps in schools. A child who has become accustomed to seeing his Earth in the form of a sphere will never get the wrong ideas that are now prevalent. He will come to realize the great savings in time as well as distance that aviators will bring to the world of commerce; he will learn the great importance of the Arctic regions to avigation; he will understand better why Commander Byrd risked his life to fly over the Pole; and what is more important he will see how close together after all, all the countries of the world will be when the airplane becomes a universal transport vehicle. Distance will become less important; direction and time will be the main considerations. For these reasons it is clear why the use of globes should be urged by those interested in the advancement of aeronautics.

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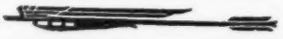

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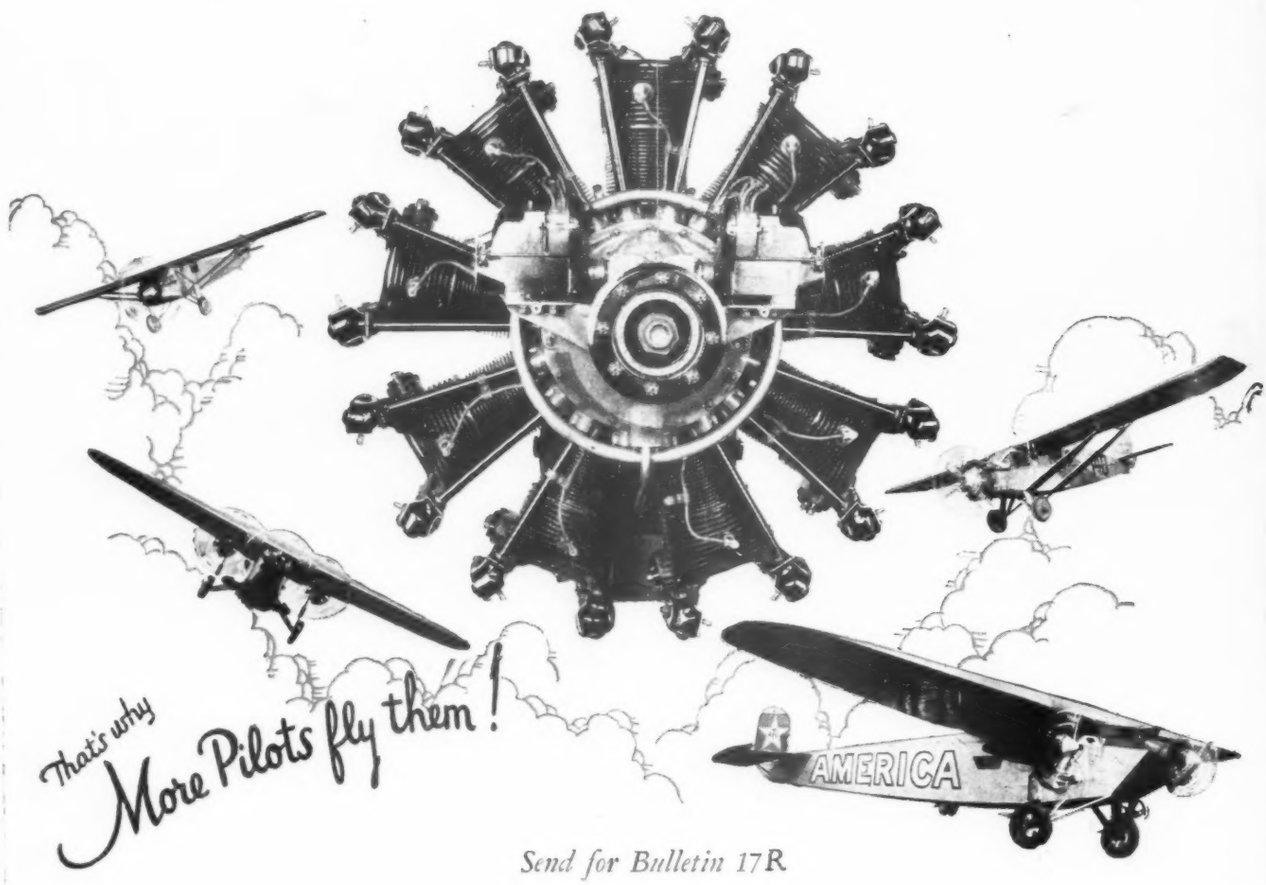
The consistent selection of this engine by these world-famous fliers—as well as by many others whose page in history is not yet written—is equalled only by the flawless operation of the engine, whose uniform performance had played a major part in these epochal events.

This choice was not haphazard. It was logically based upon the actual performance of the engine itself. Its record of over 4,635,000 miles flown during 1926, in civil and military service, is alone sufficient to justify universal confidence.



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